

## DEFINITIONS OF KEY TERMS AND CONCEPTS

In addition to the terms defined specifically for this Maricopa Sun, LLC Habitat Conservation Plan (MSHCP), additional definitions of key terms and concepts were assembled from the following sources: Federal Endangered Species Act (FESA), 50 CFR Part 402 (Interagency Cooperation regulations), United States Fish and Wildlife Service (USFWS) 1996 Habitat Conservation Planning and Incidental Take Permit Processing Handbook, and the USFWS 1998 Endangered Species Consultation Handbook.

***Access Road:*** road that connects the solar facility to the public access road.

***Biological Assessment (BA):*** information prepared by a qualified biologist to determine whether a proposed action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat. A BA is a specific document required under Section 7 of the FESA when project actions have the potential to result in a “may affect” determination.

***Biological goals:*** guiding principles that are typically qualitative rather than quantitative, and are formulated to achieve the biological conservation needs of the covered species and natural communities. The goals describe the vision for the covered species and natural communities to be achieved through implementation of a successful conservation program.

***Biological objectives:*** quantitative or measurable targets that will be sought to achieve the biological goal(s).

***California Endangered Species Act (CESA):*** California state law that requires all species threatened with extinction and those experiencing a significant decline be protected or preserved. CESA is administered by the California Department of Fish & Wildlife.

***California Natural Diversity Database (CNDDDB):*** a program that inventories the status and locations of rare plants and animals in California. CNDDDB staff work with partners to maintain current lists of rare species as well as maintain an ever-growing database of GIS-mapped locations for these species.

***Changed Circumstances:*** changes in circumstances affecting a species or geographic area covered by an HCP that can reasonably be anticipated and planned for by plan developers and the USFWS (50 C.F.R. § 17.3).

***Compliance Monitoring:*** monitoring that verifies that the Project Administrator and Developers are carrying out the terms of the MSHCP (65 FR 35241–35257).

***Conservation Sites:*** lands owned by affiliates of the Project Administrator and identified in special studies and during environmental review of the Project as having value as habitat for listed species or providing buffers for habitat conservation on which conservation easements will be recorded to remove the potential for future development.

**Covered Activities:** activities identified in the MSHCP as necessary for the construction, operations and maintenance, decommissioning, and conservation program for the solar Project and for which the Project Administrator is seeking incidental take coverage pursuant to Section 10(a)(1)(B) of the FESA.

**Critical habitat:** an area designated by the USFWS or by the National Marine Fisheries Service (NMFS) pursuant to the FESA as habitat critical to the survival of a threatened or endangered species. Critical habitat areas are specific geographic areas that may or may not be occupied by listed species, that are determined to be essential for the conservation and management of listed species, and that have been formally described and designated in the Federal Register.

**Conservation Sites:** Conservation Sites are those lands identified in special studies and during environmental review of the Project as having value as habitat for Covered Species. Conservation easements will be recorded on these lands, which total 1,894.4 acres, to permanently protect the lands for the benefit of Covered Species. These parcels will remain in their native state, or if previously disked, will be enhanced to benefit species as described in detail in Section 5.3. These lands will be conserved and managed in perpetuity as mitigation for the Project's impacts to species.

**Covered Lands:** lands covered by this MSHCP including Solar Sites, Movement Corridors, Conservation Sites, and an emergent wetland.

**Covered Species:** species identified in the MSHCP as meeting certain species selection criteria for requesting incidental take coverage and for which conservation actions will be implemented under this MSHCP.

**Developer:** any independent contractor or their subcontractors that will be constructing and operating individual solar facilities.

**Direct Effects:** a direct result of an action that occurs at the same time and place (USFWS 1996).

**Drilling areas:** areas that will be designated for future drilling operations. These areas will be reserved to allow access to owners of mineral interests for purposes of exploration and /or production of underlying oil or other mineral resources.

**Ecosystem:** a dynamic and interrelating complex of plant and animal communities and their associated nonliving (e.g., physical and chemical) environment.

**Effects Monitoring:** evaluates the actual effects of construction and O&M Covered Activities on Covered Species and designated critical habitat to verify that effects do not exceed estimates provided in Chapter 4, "Adverse Effects on Covered Species".

**Effectiveness Monitoring:** evaluates if the operating conservation program of the MSHCP is consistent with the assumptions and predictions made when the MSHCP was developed and approved (65 FR 35241–35257); if the biological goals are being met; and if the conservation

strategy is being properly implemented. Tier 1 and Tier 2 studies are implemented under the effectiveness monitoring requirement.

***Emergent wetland:*** a freshwater wetland characterized by erect, rooted, herbaceous hydrophilic plants, excluding mosses and lichens. An emergent wetland consisting of 2.55 acres has been delineated in the northwest corner of Solar Site 2-S.

***Endangered species:*** as defined in the U.S. Government Code and California Fish and Game Code (16 U.S. Government Code 1532[6] and California Fish and Game Code Section 2062), a native species, subspecies, variety of organism, or distinct population segment that is in serious danger of becoming extinct throughout all or a significant portion of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

***Environmentally Sensitive Areas (ESAs):*** locations where Covered Species or other biological resources have been identified that require some measure of active protection during the implementation of a project. Buffers are established to isolate the ESA from Covered Activities according to the resource in question.

***Existing Public Easements:*** Existing Public Easements include lands within established public right-of-ways occurring along the Project boundary. Existing Public Easements include public roadways, transmission line corridors, and a railroad line. Fifty-foot setbacks are established between all Existing Public Easements and the Project boundary. The total acreage of all Existing Public Easements is 91.8 acres. Some impacts will be assessed within Existing Public Easements as described below (Section 2.3) and in Chapter 4.

***Federal Endangered Species Act (FESA):*** the Federal Endangered Species Act of 1973, as amended, provides legal protections to federally threatened and endangered species. The law is administered by the USFWS and the NMFS.

***Habitat:*** the location where a particular taxon of plant or animal lives and its surroundings (both living and nonliving), and includes the presence of a group of particular environmental conditions surrounding an organism including air, water, soil, mineral elements, moisture, temperature, and topography.

***Habitat Conservation Plan (HCP):*** under Section 10 of the FESA, a planning document that is a mandatory component of an incidental take permit application, also known as a “Conservation Plan.”

***Habitat Enhancement Area:*** lands identified in special studies and during environmental review of the Project as having value as habitat for listed species. These lands will be protected for the life of the project; however, a conservation easement will not be recorded on these properties.

***Harm:*** an act that kills or injures a listed species through impairing essential behavior such as breeding, feeding, or sheltering. Such an act may include significant habitat modification or

degradation that results in injury of or death to listed species. Harm is one component of the legal definition of “take” under the FESA.

**Harass:** an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering [50 CFR §17.3].

**Hydric soil:** a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

**Hydrophytic vegetation:** plantlife that thrives in wet conditions; an important indicator in wetland delineation.

**Implementing Agreement:** an agreement between the applicant and the USFWS to implement and enforce an HCP.

**Incidental take:** “take” of listed species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by a federal agency or applicant. (Also, see “Take,” below).

**Incidental take permit:** a permit that exempts a permittee from the take prohibition of section 9 of the FESA issued by the USFWS or NMFS pursuant to section 10(a)(1)(B) of the FESA.

**Indirect Effects:** those effects that are caused by the proposed action (in this case, issuance of the incidental take permit and the Covered Activities) and are later in time, but are still reasonably certain to occur [50 CFR §402.02].

**Land retirement:** as used in this document, refers to the recordation of conservation easements that remove the potential for development from said land.

**Listed species:** any species, including subspecies and distinct vertebrate populations, of fish, wildlife or plant that has been determined to be endangered or threatened under section 4 of the FESA.

**Managed grazing:** grazing conducted on a periodic basis under the guidance of a qualified biologist for the purpose of weed control. Monitoring of covered species is conducted both prior to and after managed grazing to evaluate its effectiveness.

**Maricopa Sun, LLC:** Project Administrator. (Also see “Permittee,” below)

**Mitigation:** to avoid or minimize impacts of an action by limiting the degree or magnitude of the action; to rectify the impact by repairing, rehabilitating, or restoring the affected environment; to reduce or eliminate the impact by preservation and maintenance operations during the life of the action.

**Monitoring Biologist:** USFWS/CDWF-approved third-party entity that will be retained by Project Administrator (at the expense of the Developer) to provide biological monitoring required under the MSHCP, including compliance monitoring, effects monitoring, and effectiveness monitoring.

**Movement Corridors:** Movement Corridors are areas of land that were identified as being necessary for the movement of species between areas of natural habitat and to promote colonization within the region. These corridors of land will not be developed, will be managed to aid in the movement of species, and will be interspersed with developed parcels. Conservation easements on Solar Sites will be included with the associated Movement Corridor, but Movement Corridors will be managed for Covered Species immediately upon establishing the conservation easement. The total acreage of the Movement Corridors is 33.8 acres. These corridors are located along specified perimeters of the Solar Sites, but are not within the Solar Development Footprints (Figure 2-1). These corridors will be enhanced by installation of dens, perching posts, and changes in topographic relief to facilitate the movement of species and to provide connections between natural habitat patches. Movement Corridors and their role in the overall conservation strategy, including construction details such as their widths, fencing, enhancement and maintenance, and content are discussed in further detail in the Conservation Plan (Chapter 5).

**Occupied Habitat:** habitat known to be used by Covered Species based on direct confirmation during reconnaissance surveys conducted prior to initiation of the Project.

**Operating conservation program:** the conservation management activities or mitigation measures expressly agreed to in the MSHCP.

**Permit Area:** the area covered by the Section 10(a)(1)(B) Incidental Take Permit for the Maricopa Sun Solar Complex, a total of 5,784.3 acres, which are designated as (1) Solar Sites which consist of 3,798.3 acres (Solar Development Footprints, mandatory setbacks, and Movement Corridors); and (2) Conservation Sites, which encompass 1,894.4 acres.

**Permittee:** Party or parties designated in the Section 10(a)(1)(B) Incidental Take Permit /Implementing Agreement in consultation with the USFWS. The Project Administrator, Maricopa Sun, LLC, will be the sole permittee on the Section 10(a)(1)(B) Incidental Take Permit.

**Property owner:** person(s)/entity or entities identified on the most recent Kern County tax roles as being responsible for payment of property taxes on subject property.

**Qualified Biological Monitor:** An individual determined by the lead agency(ies) to be qualified to perform specified biological monitoring/survey tasks. Minimum qualifications include possession of a Bachelor of Science Degree or Bachelor of Arts Degree in biology or related environmental science, having a demonstrated familiarity with the natural history, habitat affinities, and identification of the Covered Species, and demonstrated familiarity with the MSHCP and other laws and regulations governing the take of Covered Species.

**Range:** the geographic area a species is known or believed to occupy.

**Restoration:** natural revegetation or seeding of areas anticipated to support native wildlife species, including special-status species. Natural revegetation has been shown to be effective on the Project site and it is not anticipated that additional restoration efforts would be necessary. However, effective monitoring of site conditions in conjunction with the adaptive management strategy may dictate that some active restoration in specific instances may be needed at some future time. Accordingly, seeding may be needed to re-establish a semblance of native habitat. Natural vegetation could include a variety of native species including alkali seepweed (*Sueada* sp), saltbush (*Atriplex* sp.), cheeseweed (*Isocoma acradenia*), and various native and non-native annuals.

**Section 7:** the section of the FESA outlining procedures for interagency cooperation to conserve federally listed species and designated critical habitats. Section 7(a)(1) requires Federal agencies to use their authorities to further the conservation of listed species. Section 7(a)(2) requires Federal agencies to consult with the USFWS and NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species, or destroy or adversely modify designated critical habitat. Other paragraphs of this section establish the requirement to conduct conferences on proposed species; allow applicants to initiate early consultation; require USFWS and NMFS to prepare biological opinions and issue incidental take statements. Section 7 also establishes procedures for seeking exemptions from the requirements of section 7(a)(2) from the Endangered Species Committee.

**Section 7 consultation:** the various Section 7 processes, including both consultation and conference, if proposed species are involved.

**Section 9:** the section of the FESA of 1973, as amended, that prohibits the taking of endangered species of fish and wildlife. Additional prohibitions include: (1) import or export of endangered species or products made from endangered species; (2) interstate or foreign commerce in listed species or their products; and (3) possession of unlawfully taken endangered species.

**Section 10(a)(1)(B):** that portion of section 10 of the FESA that allows for permits for incidental taking of threatened or endangered species.

**Sensitive species:** species not yet officially listed but undergoing status review for listing on the USFWS's official threatened and endangered list; species whose populations are small and widely dispersed or restricted to a few localities; and species whose numbers are declining so rapidly that official listing may be necessary.

**Solar field owner:** person(s)/entity or entities claiming an ownership interest in equipment, facilities and infrastructure involved in solar generation activities on Solar Sites. (Also see "Developer," above)

**Solar Development Footprints:** The Solar Development Footprints are those specific portions of the Solar Sites on which solar facilities will be installed. The acreage of the Solar Development

Footprints is equal to the Solar Sites minus Movement Corridors and mandatory setbacks (Table 2-1). The total acreage of the Solar Development Footprints is 3,700.5 acres.

***Solar Sites:*** The Solar Sites are lands within the Permit Area on which solar facilities will be built and include the Movement Corridors. Acreages of Existing Public Easements occurring on each parcel have been subtracted from the acreages of the Solar Sites (Table 2-1). The Solar Sites encompass 3,798.3 acres. The Solar Sites will be placed into permanent conservation easements concurrently with the acquisition of grading or building permits (whichever is obtained first) for each Solar Site, and will be managed in perpetuity for the benefit of Covered Species once the Solar Site has been decommissioned.

***Special-status species:*** special-status plant and animal species include those listed as threatened or endangered under the FESA or the CESA, species proposed for listing, species of special concern, and other species identified either by the USFWS, U.S. Forest Service (USFS), CDFW, California Native Plant Society (CNPS), or the Native Plant Protection Act (NPPA) as unique or rare, and that have the potential to occur within the Project area.

***Species:*** includes any subspecies of fish, wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife that interbreeds when mature.

***Species of Concern/Species of Special Concern:*** an informal term that refers to those species that may be in need of concentrated conservation actions. Such conservation actions vary depending on the health of the populations and degree and types of threats. At one extreme, there may only need to be periodic monitoring of populations and threats to the species and its habitat. At the other extreme, a species may need to be listed as a Federal threatened or endangered species. Species of concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species.

***Take:*** to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any listed species, or attempt to engage in any such conduct. Harm is further defined by USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding or sheltering.

***Threatened species:*** native species, subspecies, variety, or distinct population segment of an organism that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future throughout all of a significant portion of its range.

***Total Conservation Land:*** The Total Conservation Land is the sum of all acreages of Solar Sites (which includes Movement Corridors) and Conservation Sites that will be permanently conserved as mitigation for project impacts to species. These lands will be placed into conservation easements and managed in perpetuity for the benefit of Covered Species. The management of conservation easements for the benefit of Covered Species on solar development

lands will take effect once the solar facilities are decommissioned (Table 2-1). All other conservation lands will be managed for the benefit of Covered Species immediately upon recordation of the conservation easements on those lands.

***Transmission Lines:*** higher voltage electrical lines used to convey electricity from the generating source to a substation.

***Unforeseen Circumstances:*** changes in circumstances affecting a species or geographic area covered by an HCP that could not reasonably have been anticipated by plan developers and USFWS at the time of the plan's negotiation and development, and that result in a substantial and adverse change in status of the Covered Species (50 C.F.R. § 17.3).



MARICOPA SUN, LLC  
HABITAT CONSERVATION PLAN

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MARICOPA SUN SOLAR COMPLEX PROJECT  
MARICOPA SUN, LLC  
KERN COUNTY, CALIFORNIA

Appendix B  
Detailed Maps of the Maricopa Sun Solar Complex

March 2014

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MARICOPA SUN, LLC  
HABITAT CONSERVATION PLAN

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Appendix B

Detailed Maps of the Maricopa Sun Solar Complex  
Under Separate Cover

March 2014

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# DRAFT INTERIM HABITAT MANAGEMENT PLAN

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## MARICOPA SUN SOLAR COMPLEX PROJECT, KERN COUNTY, CALIFORNIA

March 2014

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Quad Knopf

# **INTERIM HABITAT MANAGEMENT PLAN**

## **Maricopa Sun Solar Complex Project, Kern County, California**

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**March 2014**

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## 1.0 INTRODUCTION

The Maricopa Sun Solar Complex will be constructed within a 5,784.3-acre Permit Area, located in southwestern Kern County. Upon full build-out, the Maricopa Sun Solar Complex Project will result in a combination of Solar Sites (consisting of photovoltaic panels, inverters, transformers, transmission lines, and other associated infrastructure), Movement Corridors (areas managed to facilitate wildlife movement around the Solar Sites), and Conservation Sites (areas managed to provide habitat for wildlife).

This Interim Habitat Management Plan (IHMP) describes the ecological and resource management actions that will take place on the Conservation Sites, Solar Sites and Movement Corridors during the Interim Period. Conservation Sites, Solar Sites and Movement Corridors are anticipated to be added to and managed according to this IHMP as the various Solar Sites are developed. The Interim Period will last 35 years and will conclude with the expiration of the Maricopa Sun Multiple Species Habitat Conservation Plan. The IHMP includes capital expenditures (e.g. initial fence installation, signage installation, earthwork) as well as an increased level of monitoring that will be implemented during the Interim Period. The IHMP will be implemented conjunctively with the Long Term Habitat Monitoring Plan (LTHMP), until the conclusion of the Interim Period, at which point the Project will be managed solely by the LTHMP.

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## 1.1 Background

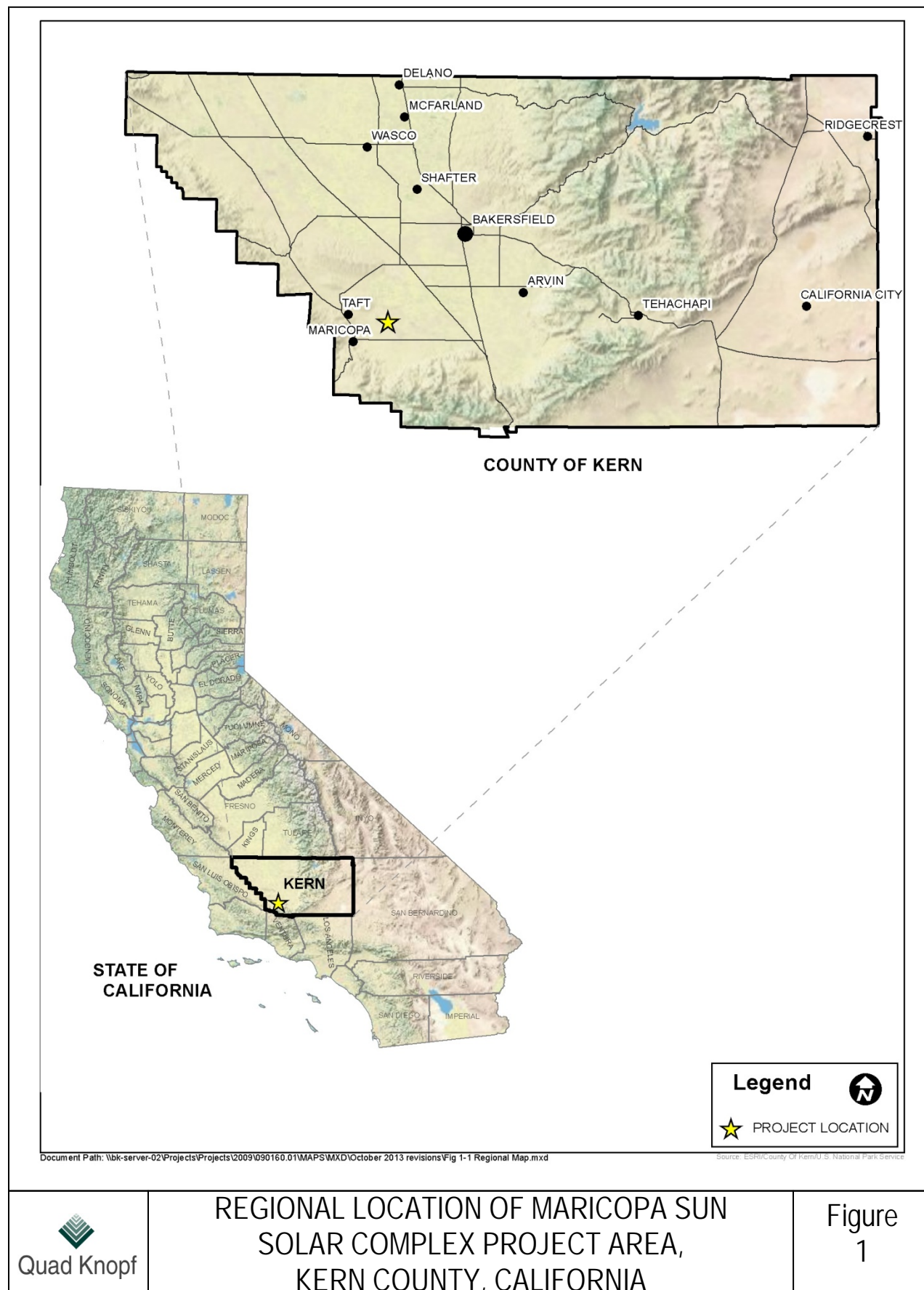
The Maricopa Sun Solar Complex will be constructed within a 5,784.3-acre Permit Area, located in southwestern Kern County (Figure 1). The Project will result in the creation of three different land types (Figure 2): Solar Sites, which will include the photovoltaic panels and associated infrastructure; Movement Corridors, which are areas designed to facilitate wildlife movement around the Solar Sites; and Conservation Sites, which will be permanently conserved and managed as wildlife habitat, concurrent with the development of the Solar Sites. The construction of the Project will be phased and is anticipated to take approximately 10-15 years to reach full build-out. The Project is anticipated to last 35 years, including decommissioning. This IHMP and the Habitat Conservation Plan (MSHCP) (Maricopa Sun, LLC Habitat Conservation Plan 2014) associated with the Project is being developed for incidental take coverage for San Joaquin kit fox (*Vulpes macrotis mutica*), Tipton kangaroo rat (*Dipodomys nitratoides*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), western burrowing owl (*Athene cunicularia*), and blunt-nosed leopard lizard (*Gambelia sila*) (collectively, Covered Species).

Maricopa Sun, LLC (Project Administrator) is the Permittee for the Project and will maintain an ongoing administrative role in all phases and aspects of the Project, including ongoing habitat management for the Conservation Sites. Any transfer of ownership or administrative obligations of the Conservation Sites will be approved in writing by the United States Fish and Wildlife Service (USFWS).

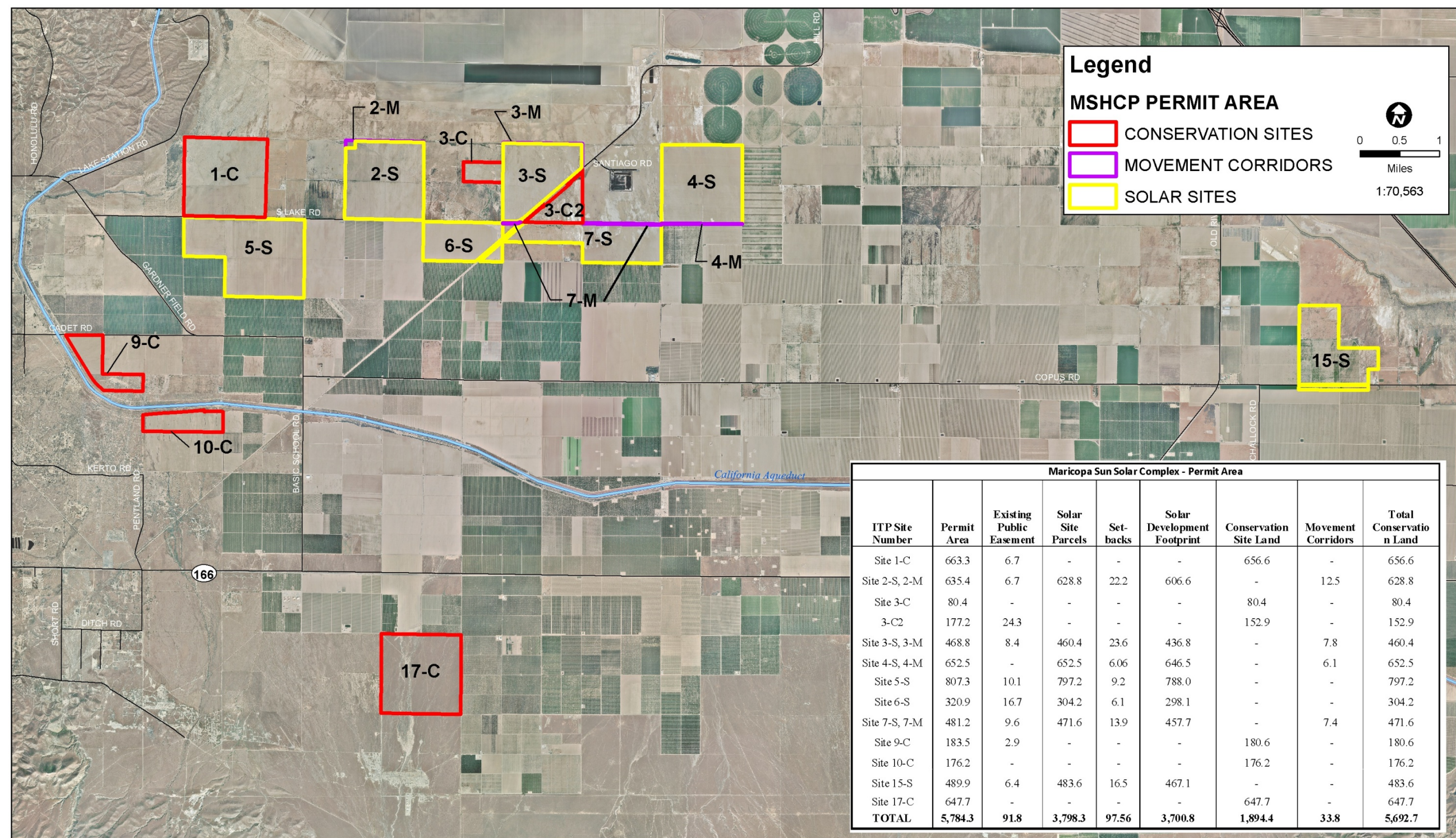
## 1.2 Scope and Purpose

This IHMP is intended to describe all of the ecological and resource management activities that will take place on the Conservation Sites, Solar Sites and Movement Corridors during the 35-year life of the Project, as well as all necessary capital ecological improvement actions within the Permit Area (Table 1). The Project will be phased; thus, various ecological management activities may begin and end at different times throughout the life of the Project. The IHMP differs from the Long-Term Habitat Management Plan (LTHMP), in that the LTHMP describes activities that will commence with the recordation of the Conservation Easement on a particular property, will be limited to the Conservation Sites, and will continue on in perpetuity; whereas the IHMP will commence with the development of a Solar Site, will have activities on all three land types (Solar Sites, Movement Corridors, and Conservation Sites; individual parcels within the Permit Area without respect to land types are, Sites), and will last only for the duration of the MSHCP/Project. The purpose of having two plans that are implemented conjunctively is to account for the capital improvement actions (e.g. fence installation, signage installation, earthwork) and increased study associated with the 35-year term of the MSHCP (via the IHMP) and, at the same time, describe the mitigation actions that will continue in perpetuity on the Conservation Sites (via the LTHMP). This also provides for a distinction in funding, where IHMP activities will be funded directly or indirectly by the Project Administrator and LTHMP activities will be paid for by the interest generated from the funded endowment account.









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# SITE PLAN MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure  
2



**Table 1**  
**Habitat Management Plan Comparison**

	<b>Interim Habitat Management Activities</b>	<b>Long-term Habitat Management Activities</b>
Starting Action	Upon development of Solar Site	Upon recordation of Conservation Easement on Conservation Sites
Duration	35 years/Permitted life of Project	Perpetuity
Land Types	Solar Sites, Movement Corridors, Conservation Sites	Conservation Sites (will cover all sites) following decommissioning of Solar Sites)

The IHMP and the LTHMP will be implemented conjunctively and thus have management activities that overlap (e.g., annual reporting, trash removal, species monitoring). For activities where the IHMP and LTHMP overlap, the activity will be paid for initially via the funding of the IHMP. Following the completion of overlapping activities, the Project Administrator may bill the endowment associated with the LTHMP (assuming that the endowment has the funds accumulated and available) to recover the cost of the overlapping activities. There will also be monitoring and clearance surveys associated with the pre-construction, construction, operations and maintenance, and decommissioning of the Solar Sites. Monitoring and clearance surveys are not covered in this IHMP or the LTHMP.

### **1.3 Phasing**

The Project is anticipated to be constructed over the next 10-15 years as market demands and interest dictate (additional details regarding Project Phasing can be found in Chapter 8 of the MSHCP 2014). The construction of solar facilities on the Solar Sites precipitates the conservation of a proportionate amount of the Conservation Sites and the designation of Movement Corridors, where applicable. The construction of a Solar Site also triggers the applicability of this IHMP and the activities described herein. The Project has an anticipated 35-year lifespan (Interim Period), at which point the Solar Sites will be decommissioned and the solar facilities removed. During the Interim Period, the Solar Sites will be managed for solar operations and not specifically for Covered Species. The future development of the Solar Sites will be limited by a “Springing” Conservation Easement that will take effect following the conclusion of the term of the MSHCP. The idea of a “springing conservation easement” is that the lands intended for conservation will be managed for another purpose during an initial timeframe (i.e., the Interim Period) and then, once the Interim Period (following decommissioning) is complete, will “spring” into effect as conservation lands under the Conservation Easement. Following decommissioning, the Solar Sites will be protected and managed for Covered Species and become subject to the LTHMP. Any capital ecological improvements required for the Solar Sites, as the decommissioned Solar Sites are transitioned to management via the LTHMP, will be paid for via the IHMP.

### **1.4 IHMP Funding**

Funding for the implementation of IHMP activities (both capital improvements and monitoring actions) will be provided by the Project Administrator. Prior to the development of any individual Phase of the Project, an IHMP implementation security (Security) will be provided by the Project Administrator to the Conservation Easement Holder in the form of an irrevocable

standby letter of credit (LOC). The Security will be maintained in an amount sufficient to complete the three following years of IHMP activities in each developed phase (Table 10-2). The first year of development of any individual Phase will require a greater Security amount, because of capital improvement costs in Year 1 (Year 1 LOC), but then following completion of the capital improvement activities, the Security will decrease to and be maintained for the duration of the Project. A level of funding sufficient to implement the subsequent three years of IHMP monitoring activities (Ongoing LOC; Table 2). The Project Administrator will ensure that the appropriate amount of Security will remain in effect throughout the duration of the Project. Specific details of the Security calculation can be found in Exhibit A to the IHMP.

**Table 2**  
**Interim Habitat Management Plan – Phased Security Summary**

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Construction Cost	\$181,282	\$146,322	\$105,329	\$86,502	\$146,005	\$ -
Annual Monitoring Cost	\$27,034	\$42,390	\$58,907	\$74,457	\$91,168	\$91,168
Tier 2 Monitoring Cost	\$72,600	\$130,680	\$174,240	\$203,280	\$232,320	\$261,360
<u>Year 1 LOC*</u> (3 years of IHMP activities w/ construction)	\$480,183	\$665,531	\$804,771	\$919,712	\$1,116,469	\$1,057,584
<u>Ongoing LOC**</u> (3 years of IHMP activities, no construction)	\$298,901	\$519,209	\$699,442	\$833,210	\$970,464	\$1,057,584

\*Calculated by adding “Construction Cost” to 3 years of “Annual Monitoring Cost” and 3 years of “Tier 2 Monitoring Cost”

\*\*Calculated by adding 3 years of “Annual Monitoring Cost” and 3 years of “Tier 2 Monitoring Cost”

## **1.5 Project Description**

### **1.5.1 GEOGRAPHY, TOPOGRAPHY, CLIMATE**

The Project is located approximately five miles east of the City of Taft in an unincorporated portion of southwestern Kern County, generally along South Lake Road and Old River Road, east of Gardner Field Road. The Project is made up of multiple, non-contiguous parcels totaling 5,784.3 acres. Three of the Conservation Sites are located approximately 2-5 miles south of South Lake Road, where the majority of the Solar Sites are located.

The Permit Area lies just north of the Transverse Ranges, near the base of the San Emigdio Mountains, east of the Temblor Range and south of the historic southern shore of Buena Vista Lake. The Permit Area lands are level, consisting predominantly of disked, fallowed agricultural fields, levees, berms, and roadways; with some Conservation Sites being ruderal land or naturalized/native habitat. Elevations within the Permit Area range from approximately 320 feet above mean sea level (AMSL) to the east to 900 feet AMSL to the south. Low undulating relief remains on parcels within the Permit Area that are disked, but they have not been laser leveled nor do they retain their natural topography.

The Permit Area has a Mediterranean climate, with cool wet winters and hot dry summers. The average high temperatures are 48.5 degrees Fahrenheit in the winter and 94.8 degrees Fahrenheit in the summer. The average annual precipitation is 6.32 inches, falling predominantly as rain. The prevailing wind is from the west-northwest, with highest wind speeds in April and May, averaging 7.7 miles per hour (USDA 2009).

## 1.5.2 SURROUNDING LAND USE

Lands adjacent to the Permit Area consist predominantly of active agricultural cultivation including permanent tree crops (e.g., almonds, cherries), row and field crops (e.g., carrots, alfalfa), actively disked fallowed ground, and uncultivated grasslands used for grazing. The uncultivated grazing ground consists of natural or naturalized grasslands habitats, and in some areas provides connectivity to the Buena Vista Hills to the west and San Emigdio Mountains to the south. The grasslands to the west and south also are used for oil production and are associated with the Midway Sunset Oil Field and the Naval Petroleum Reserve.

## 1.5.3 SOILS

The soils within the Permit Area are highly variable, consisting of nine different soil types (Table 2).

## 1.5.4 HYDROLOGY

The only significant active hydrologic feature near the Permit Area is the Kern River, about 11 miles to the north. Several smaller blue-line streams flow out of the San Emigdio Mountains to the south and the Transverse Range to the west, all terminating at Buena Vista Lake. Portions of the Permit Area are also mapped by the Federal Emergency Management Area as being within the 100-year floodplain. Santiago Creek, a named blue-line feature, flows through Conservation Site 17-C, and several other unnamed blue-line features are mapped throughout the Permit Area. Santiago Creek is a likely, though unconfirmed, “Water of the U.S.” as defined by the Clean Water Act. The only verified wetlands or waters that occur within the Permit Area that are under federal authority are a 2.55-acre wetland area located in the extreme northwest corner of Solar Site 2-S, and a Water of the U.S. occurring on Conservation Site 1-C. The remaining hydrologic features in the vicinity of the Permit Area consist of man-made water conveyance facilities, such as irrigation ditches, canals and the California Aqueduct.

**Table 3**  
**Soil Types Occurring Throughout the Maricopa Sun Solar Complex**

<b>Location</b>	<b>Soil Type Present</b>
<b>Site 1-C</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 153-Tupman gravelly sandy loam (0-2 percent slopes), 160-Fages clay (0-1 percent slopes), and 352-Posochanet-Posochanet (partially reclaimed association, 0-1 percent slopes)
<b>Site 2-S, 2-M</b>	133-Calflax loam (0-1 percent slopes) and 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
<b>Site 3-S, 3-M</b>	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
<b>Site 3-C</b>	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
<b>Site 3-C2</b>	133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
<b>Site 4-S, 4-M</b>	133-Calflax loam (0-1 percent slopes) and 350-Posochanet silt loam (saline-sodic, 0-1 percent slopes)
<b>Site 5-S</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 150-Excelsior sandy loam (0-2 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 152-Excelsior loam (0-2 percent slopes)
<b>Site 6-S</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
<b>Site 7-S, 7-M</b>	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
<b>Site 9-C</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 150-Excelsior sandy loam (0-2 percent slopes)
<b>Site 10-C</b>	132/134-Cerini loam (0-2 percent slopes/2-5 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
<b>Site 15-S</b>	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic; 0-2 percent slopes), and 160-Fages clay (0-1 percent slopes)
<b>Site 17-C</b>	134-Cerini loam (0-2 percent slopes) and 192-Guijarral-Klipstein complex (2 -5 percent slopes)

### 1.5.5 HABITAT TYPES

The habitat type within the Permit Area consists predominantly of disked, fallowed farmland. All of the Solar Sites and Movement Corridors, and some of the Conservation Sites (1-C, 3-C and a portion of 9-C) are disked regularly to maintain the Sites free of vegetation. Conservation Site 17-C and an approximately 80-acre portion of Conservation Site 9-C appear to be un-disked, retain their natural topography, and have vegetation consisting of a mixed non-native annual grassland and saltbush scrub mosaic consistent with other surrounding natural areas. Conservation Site 3-C2 was disked approximately 6 years ago and appears to be in the process of returning to an annual grassland.

The disked portions of the Permit Area provide very little habitat value for plants and wildlife. Regular disking prevents the colonization of plants and animals, and because the sites remain fallow, there is no wildlife benefit from the production of agricultural crops. These disked fields

only provide open space that allows for movement of wildlife across the fields, and marginal foraging opportunities when adjacent to parcels that contain natural communities.

The un-disked Conservation Sites (both intact and recovering) provide significant habitat value and connectivity to local plant and wildlife communities. Much of the surrounding area, as well as the broader of the San Joaquin Valley, have been converted to agricultural production or urban development. This development has reduced the acreage of native habitat and reduced the populations of native plants and wildlife. These un-disked Conservation Sites, as well as the other Conservation Sites following the cessation of disking, provide critical refugia for native plants and wildlife and contribute to the persistence of these species.

### 1.5.6 CONSERVATION AND ENDANGERED SPECIES RECOVERY VALUE

The Permit Area, upon construction, will immediately begin to contribute to the recovery of species. Concurrent with the start of development, the Conservation Sites will begin to be permanently protected with Conservation Easements, have endowments to ensure long-term management, and will be monitored and managed for their habitat values. Further, the Solar Sites will be managed in a way that does not preclude wildlife and endangered species colonization. The Solar Sites, while in energy production, will only provide marginal habitat value, but they are anticipated to be colonized by plant and wildlife species, which will result in an increase in locally available habitat over the previously disked condition. Upon decommissioning, the Solar Sites will have the energy production facilities and infrastructure removed, and the Solar Sites will be protected by the Springing Conservation Easement and managed for their habitat values for Covered Species.

The various land types within the Permit Area will contribute to the recovery of species to varying degrees during the energy production life of the Project. The Conservation Sites (and the remainder of the Project following decommissioning) contribute to the following recovery priorities and tasks as outlined in the Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998):

1. Recovery Task 2.1.4 (Priority 1) – Protection of large blocks of land in Western Kern County;
2. Recovery Task 3.2.22 (Priority 3) – Multispecies animal surveys for upland vertebrates, southwestern Valley edge;
3. Recovery Task 4.26 (Priority 1) – Monitoring/Studies on dispersal, movement, diet, reproduction, use of agricultural fields, use of artificial dens for San Joaquin kit fox;
4. Recovery Task 5.3.8 (Priority 2) – Protection of linkage areas around the San Joaquin Valley Edge; and
5. Recovery Task 6 (Priority 3) – Apply adaptive management to protected areas.

The Project will contribute to the large matrix of protected land that already exists in western Kern County, and will add to the growing corridor of habitat that connects the Wind Wolves Preserve with the Naval Petroleum Reserve. The Project will also contribute to the creation of an east-west corridor of protected land that will connect the historic southern shores of Buena Vista and Kern Lakes.

### 1.5.7 SENSITIVE SPECIES AND VEGETATION COMMUNITIES

Western Kern County is a well-known and important area for sensitive San Joaquin Valley endemic species. While the majority of the Permit Area is disked and does not support any species, many sensitive species and sensitive vegetation communities are known from the area (Table 3).

**Table 4**  
**Sensitive Species and Vegetation Communities**

Scientific Name	Common Name	Status
<b>Sensitive vegetative communities</b>		
Great Valley Cottonwood Riparian Forest	Great Valley Cottonwood Riparian Forest	Protected under CEQA
Great Valley Mesquite Scrub	Great Valley Mesquite Scrub	Protected under CEQA
Valley Sacaton Grassland	Valley Sacaton Grassland	Protected under CEQA
Valley Saltbush Scrub	Valley Saltbush Scrub	Protected under CEQA
Valley Sink Scrub	Valley Sink Scrub	Protected under CEQA
<b>Plants</b>		
<i>Allium howellii</i> var. <i>clokeyi</i>	Mt. Pinos onion	1B.3
<i>Astragalus hornii</i> var. <i>hornii</i>	Horn's milk-vetch	1B.1
<i>Atriplex cordulata</i>	Heartscale	1B.2
<i>Atriplex tularensis</i>	Bakersfield smallscale	CE, 1B.1
<i>Atriplex coronata</i> var. <i>vallicola</i>	Lost Hills crownscale	1B.2
California ( <i>Erodium</i> ) <i>macrophyllum</i>	round-leaved filaree	1B.1
<i>Caulanthus californicus</i> ( <i>Stanfordia californica</i> )	California jewel-flower	FE, CE, 1B.1
<i>Caulanthus coulteri</i> var. <i>lemmonii</i>	Lemmon's jewelflower	1B.2
<i>Cirsium crassicaule</i>	slough thistle	1B.1
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	Hispid bird's beak	1B.1
<i>Delphinium recurvatum</i>	recurved larkspur	1B.2
<i>Eremalche kernensis</i>	Kern mallow	FE, 1B.1
<i>Eriastrum hooveri</i>	Hoover's eriastrum	4.2
<i>Eschscholzia lemmonii</i> ssp. <i>kernensis</i>	Tejon poppy	1B.1
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	1B.1
<i>Layia hetereotricha</i>	Pale-yellow layia	1B.1
<i>Layia leucopappa</i>	Comanche Point layia	1B.1
<i>Monardella linoides</i> ssp. <i>oblonga</i>	Tehachapi monardella	1B.3
<i>Monolopia congdonii</i>	San Joaquin woollythreads	FE, 1B.2
<i>Stylocline citroleum</i>	oil neststraw	1B.1
<b>Invertebrates</b>		
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT
<i>Euproserpinus euterpe</i>	Kern primrose sphinx moth	FT
<b>Fishes</b>		
<i>Hypomesus transpacificus</i>	Delta smelt	FT, CT



**Table 4**  
**Sensitive Species and Vegetation Communities (Continued)**

Scientific Name	Common Name	Status
<b>Amphibians</b>		
<i>Rana aurora draytonii</i>	California red-legged frog	FT
<i>Spea hammondi</i>	western spadefoot	CSC
<b>Reptiles</b>		
<i>Actinemys marmorata pallida</i>	western pond turtle	CSC
<i>Anniella pulchra pulchra</i>	silvery legless lizard	CSC
<i>Gambelia sila</i>	blunt-nosed leopard lizard	CE, FE, CDFW fully protected
<i>Masticophis flagellum ruddocki</i>	San Joaquin whipsnake	CSC
<i>Phrynosoma blainvillii</i>	California horned lizard	CSC
<i>Thamnophis gigas</i>	giant garter snake	FT, CT
<b>Birds</b>		
<i>Agelaius tricolor</i>	tricolored blackbird	CSC
<i>Athene cunicularia</i>	western burrowing owl	CSC
<i>Buteo swainsoni</i>	Swainson's hawk	CSC
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	FT
<i>Charadrius montanus</i>	mountain plover	CSC
<i>Circus cayaneus</i>	Northern harrier	CSC
<i>Coccyzus americanus occidentalis</i>	western yellow-billed cuckoo	CE
<i>Dendrocygna bicolor</i>	fulvous whistling-duck	CSC
<i>Elanus leucurus</i>	white-tailed kite	CDFW fully protected
<i>Eremophila alpestris actia</i>	California horned lark	CDFW watch list
<i>Falco mexicanus</i>	prairie falcon	CDFW watch list
<i>Gymnogyps californianus</i>	California condor	FE, CE
<i>Lanius ludovicianus</i>	Loggerhead shrike	CDFW watch list
<i>Plegadis chihi</i>	white-faced ibis	CDFW watch list
<i>Toxostoma lecontei</i>	Le Conte's thrasher	CSC
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	CSC
<b>Mammals</b>		
<i>Ammospermophilus nelsoni</i>	Nelson's antelope squirrel	CT
<i>Dipodomys ingens</i>	giant kangaroo rat	FE, CE
<i>Dipodomys nitratoides brevinasus</i>	short-nosed kangaroo rat	CSC
<i>Dipodomys nitratoides nitratoides</i>	Tipton kangaroo rat	FE, CE
<i>Eumops perotis californicus</i>	western mastiff bat	CSC
<i>Onychomys torridus tularensis</i>	Tulare grasshopper mouse	CSC
<i>Perognathus inornatus inornatus</i>	San Joaquin pocket mouse	CSC, BLMS
<i>Sorex ornatus relictus</i>	Buena Vista Lake shrew	FE
<i>Taxidea taxus</i>	American badger	CSC
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	FE, CT

### **Status Definitions**

- FE Federally Endangered
- CE California Endangered
- 1B.1 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Seriously Endangered in California
- 1B.2 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Fairly Endangered in California.
- 1B.3 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Not Very Endangered in California
- 4.2. Plants of limited distribution - Watch list, fairly endangered in California (20-80% occurrences threatened)

## 2.0 GOALS, OBJECTIVES AND MANAGEMENT

This section of the IHMP describes the ecological management, monitoring and adaptive management activities that are anticipated to be conducted on the Project. The IHMP will be administered by the Project Administrator as outlined in this IHMP, but actual management activities may be performed by a separate management entity as authorized by the USFWS. Funding for the implementation of this IHMP will be provided the Project Administrator.

### 2.1 *Goals and Objectives*

The primary biological goal of this IHMP and of the broader MSHCP (Maricopa Sun, LLC MSHCP 2014, Chapter 5) is to preserve the species and habitats for which the MSHCP has been prepared.

This goal is realized by accomplishment of the following objectives:

- Maintain, to the maximum extent possible and consistent with solar development, the ability of San Joaquin kit fox (SJKF) to disperse through the Permit Area and within the region;
- Preserve existing populations of the Tipton kangaroo rat (TKR) within the Permit Area, provide habitat for the TKR within the Permit Area;
- Preserve existing populations of the Nelson's antelope squirrel (NAS) within the Permit Area, provide habitat for the NAS within the Permit Area;
- Preserve existing populations of the western burrowing owl (WEBO) within the Permit Area, provide habitat for the WEBO within the Permit Area;
- Provide habitat for the blunt-nosed leopard lizard ("BNLL") within the Permit Area.

Species-specific objectives and tasks are described in Section 3.2 of this IHMP. Tasks in this IHMP are anticipated to commence concurrently with the construction of facilities on the first Solar Site, and will be conducted on Solar Sites, Movement Corridors and Conservation Sites as appropriate. Lands will be added to this plan iteratively until full build-out is completed, and will last for the duration of the permit (35 years). Long-term management goals and objectives are described in the associated Maricopa Sun Solar Complex Long-Term Habitat Management Plan.

### 2.2 *Management and Personnel*

The Project Administrator shall retain professional biologists, botanists, grazing managers, machinery operators, and other specialists to conduct specialized tasks (Qualified Personnel). The Monitoring Biologist is one of the Qualified Personnel. This person will be familiar with California flora and fauna and shall have knowledge regarding the ecology of the San Joaquin Valley and the habitats of the Project and the region. Qualified Personnel shall have a valid Section 10(a)(1)(a) permit for the appropriate species, when tasks require activities that would

normally require such a permit (e.g., trapping for the Tipton kangaroo rat). The Monitoring Biologist will be approved by the USFWS to conduct biological monitoring under the terms and conditions of the MSHCP.

General administration and implementation of this IHMP is the responsibility of the Project Administrator. The Project Administrator will work with the Monitoring Biologist and other Qualified Personnel to ensure that all tasks outlined in this IHMP are completed. The Project Administrator, Monitoring Biologist, and Qualified Personnel will work together as a team to implement this IHMP by exchanging information, problem solving and generally having a proactive relationship. If the Project Administrator or entity implementing Project Administrator responsibilities changes, the incoming and outgoing personnel will tour the Project together and the latter will inform the former of trends and problem areas, and will review past annual reports and identify any administrative issues.

Duties of the Monitoring Biologist may include, but are not limited to:

- Conducting biological surveys, collecting data, and preparing reports required by this IHMP;
- Evaluating conditions on the Project and recommending actions to the Project Administrator;
- Identifying and reporting opportunities and needs for adaptive management actions to the Project Administrator;
- Conducting thatch/exotic plant management activities, when necessary, with the Project Administrator; or
- Installing artificial dens and other habitat enhancements.

Other Qualified Personnel may be responsible for tasks such as:

- Implementing vegetation management activities like grazing, chemical control application, or mechanical removal; and
- Installing topographic relief features and other capital improvement activities.

### 3.0 ECOLOGICAL MANAGEMENT ACTIVITIES

The following specific objectives and tasks are designed to act as enhancements that further the above listed goals and objectives. These objectives and tasks provide habitat value beyond just the protection of the land, by creating supplemental habitat values that enhance the habitat value of the Project during the life of the permit. The following objectives and tasks are divided into species-specific objectives and tasks and Project-wide objectives and tasks. Tasks will be proportional to the amount of the Project that has been constructed (e.g., 50 percent of the Project has been constructed, therefore 50 percent of the total fencing will have been installed), such that upon full build-out, all of the tasks will have been implemented.

### **3.1 Project-wide Objectives and Tasks**

“Project Wide Objectives and Tasks” include management activities that, unless otherwise specified, are applicable to the broader habitat values of the Project and are not necessarily specific to the Covered Species.

#### **3.1.1 FENCING**

##### **Objective:**

1. Install fencing to discourage unauthorized access.

##### **Task:**

1. The Project is being designed to allow and facilitate the movement of wildlife through the Conservation Sites, Movement Corridors and Solar Sites, but perimeter fencing is necessary to provide security, prevent trespass, etc., across the Project. To that end, wildlife permeable fencing will be installed around each of the Project’s land types. The Solar Site will have wildlife permeable security fencing, specifications of which can be found in Chapter 2 of the MSHCP (approximately 165,000 linear feet), which will be installed and maintained separately from this IHMP. The perimeter of the Conservation Sites and the exterior perimeter of the Movement Corridors will have a minimum of three-strand barbed wire fencing installed, with the bottom wire being barbless to contribute to the permeability of the fence for larger animals like the San Joaquin kit fox (approximately 114,750 linear feet). Development of the Project is anticipated to be phased and as such, fencing will be installed on the Conservation Sites and Movement Corridors as the Solar Sites are developed. Conservation Site 17-C is currently the only property on the Project that has existing fencing. When Conservation Site 17-C is protected, the existing fence will be inspected for its adequacy and any repairs or upgrades will be made. At least one gate will be installed on each Conservation Site and Movement Corridor to provide access for monitoring, maintenance and emergency access. Upon decommissioning of the Solar Sites, the security fence will be removed, and it will be replaced with fencing as described above for Conservation Sites.
2. Perimeter fencing and gates around Conservation Sites and Movement Corridors will be examined at least twice annually during the General Examinations (see 3.1.4 below), but fencing is anticipated to be casually observed during many of the Project’s associated activities. All issues related to the integrity of the fencing shall be immediately reported to the Project Administrator, and the Project Administrator shall make repairs as soon as practicable. The Project Administrator is responsible for implementing the repair, maintenance and replacement of all fencing, as well as ensuring that all gates remain locked to prevent unauthorized access. Additional temporary or permanent fencing may be added for maintenance purposes, grazing control, adaptive management activities, etc. Plans for changes in fencing alignment or additional fencing in the coming year will be noted in the prior year’s annual report or following discussion with the USFWS.

Access to the Conservation Sites and Movement Corridors will be prohibited, except for activities described in this IHMP, the LTHMP, and the MSHCP. Access to the Project in emergency or law-enforcement situations by medical, fire or law enforcement personnel and vehicles is allowed. Except in cases where the USFWS determines that immediate entry is required to prevent, terminate or mitigate a violation of this IHMP, access to the Conservation Sites will be provided to the USFWS with 48 hours of notice.

### 3.1.2 SIGNAGE

#### **Objective:**

1. Install and maintain signage to discourage unauthorized access.

#### **Task:**

1. A variety of signage will be placed around the Project. Signage that discourages public access on the Conservation Sites and Movement Corridors, and informs the public of the protection of the habitat values of the Conservation Sites and Movement Corridors will be installed around the perimeter of the Project at a rate of no less than 3 signs per mile (approximately 150 signs). Signs will be installed on the perimeter fencing to the maximum degree practicable, but may be installed on free-standing posts where appropriate.
2. Perimeter signage will be inspected at least twice annually during the General Examinations (see 3.1.4 below), but sign condition is anticipated to be casually observed during many of the Project's associated activities. All issues related to the integrity of the signage shall be immediately reported to the Project Administrator, and the Project Administrator shall make repairs as soon as practicable. The Project Administrator is responsible for implementing the repair, maintenance and replacement of all signage.

### 3.1.3 EARTHWORK

#### *3.1.3.1 Movement Corridors*

#### **Objective:**

1. Install topographic features in the disked Movement Corridors and Conservation Areas to provide refugia in the event of flooding.

#### **Task:**

1. Raised earthen berms will be created along the Movement Corridors to provide refugia in the event of flooding. These berms will also be the location for the installation of artificial San Joaquin kit fox dens (see Section 3.2.1, below) and burrowing owl perching posts (see Section 3.2.4, below). The berms will be constructed concurrent with the development of the associated Solar Site, using tractors or other heavy machinery. The berms will be oriented linearly in the direction of the Movement Corridor, and will be generally contiguous with

gaps installed to facilitate the movement of flood water across the berms. The berms will be constructed of compacted earth collected from the Movement Corridor or from within the Solar Sites during the construction phase. The berms will be a minimum of 15 feet wide, with a maximum height of 6 feet above grade, which will allow for settling and erosion. A ditch of no more than 10 feet wide by 3 feet deep will be constructed along the upslope side of each berm. The ditch will aid in collecting flood water and directing it off of the Project, as well as providing additional topographic complexity to the Movement Corridors.

#### *3.1.3.2 Conservation Sites*

Topographic relief will be installed in flood prone areas of the Conservation Sites. The construction of the topographic relief is described in detail in Chapter 5 of the MSHCP (Maricopa Sun, LLC MSHCP 2014).

### **3.1.4 GENERAL EXAMINATIONS**

#### **Objective:**

1. Perform General Examinations of the Conservation Sites to evaluate habitats and infrastructure.

#### **Task:**

1. General Examinations shall occur twice annually (once in the spring and once in the fall) by Qualified Personnel, and will focus on an evaluation of: erosion, fire hazard reduction, fencing integrity, condition of signage, trash accumulation, and evidence of unauthorized vehicle use. The entire perimeter of the Project (that has been constructed) will be observed, and meandering transects will be conducted through the entirety of the Project. All observations will be recorded and included in the annual report. Previous reports should be reviewed prior to General Examinations, to help identify potential trouble spots or recurring problem areas. If any maintenance issues are identified, more frequent examinations may be performed to identify if a problem is a recurring issue and whether remedial actions are effective.

#### *3.1.4.1 Erosion*

#### **Objective:**

1. Reduce erosion that negatively affects habitat values.

#### **Task:**

1. If it is determined during the General Examinations that drainage is causing any erosion or other adverse effects that threaten the habitat values of the Conservation Sites and Movement Corridors, the Project Administrator will be notified, and erosion control measures will be implemented.

#### 3.1.4.2 Fire Hazard

**Objective:**

1. Reduce the potential for fire hazard.

**Task:**

1. If at any time conditions on the Conservation Sites become a fire hazard (as determined or requested by the Kern County Fire Department), the Project Administrator will work with the USFWS and the local fire authorities to determine the best method to reduce the fire risk.

#### 3.1.4.3 Trash

**Objective:**

1. Remove trash from the Conservation Sites.

**Task:**

1. Any trash found on the Conservation Sites during the General Examinations will be removed during the General Examination. Trash on the Solar Sites or generated by the Solar Sites will be managed according to the MSHCP. If trash is regularly accumulating on the Conservation Sites or Movement Corridors, the Project Administrator will implement actions to further prevent dumping. In the event that trash has accumulated or a dumping event has occurred that cannot be removed during the General Examinations, the Project Administrator will be notified and will be responsible for the removal of the trash from the Conservation Sites and Movement Corridors. In no event shall personnel performing General Examinations be responsible for removing trash associated with construction, operations and maintenance, or decommissioning of the Solar Sites, as that will be the responsibility of the Project Administrator.

#### 3.1.4.4 Trespass

**Objective:**

1. Discourage unauthorized access to the Conservation Sites.

**Task:**

1. The perimeter of the Conservation Sites will be examined for evidence of unauthorized access. If evidence of unauthorized access is found, the Project Administrator will be notified and actions will be taken to repair any damage and develop additional measures to prevent future unauthorized access to the maximum extent practicable.

### 3.1.5 VEGETATION MANAGEMENT

Most of the Permit Area is disked biannually, but upon development of the Solar Sites and resultant protection of the associated Conservation Sites, disking will be discontinued. It is anticipated that vegetation will quickly begin to recolonize these sites once disking ceases. The Covered Species are most often associated with desert grassland/shrubland habitats that have low topographic relief and sparse shrub cover. Dense or tall vegetation can inhibit movements of the Covered Species and can make predator detection and avoidance more difficult (USFWS 1998). The vegetation on the Solar Sites will be managed separately from this IHMP, in a manner that facilitates operations and maintenance of the solar facilities as described in the MSHCP. The vegetation on the Movement Corridors and Conservation Sites will be managed for the benefit of the Covered Species. Vegetation on the Movement Corridors and the Conservation Sites will be managed predominantly by grazing of livestock (likely sheep), but other vegetation management techniques and tools (e.g., controlled burns, mowing, hand removal) may be used at the recommendation of the Qualified Personnel and Project Administrator, upon coordination with and authorization by the USFWS.

#### **Objective:**

1. Manage vegetation on the Movement Corridors to be 500 to 1,500lbs./acre of Residual Dry Matter (RDM).

#### **Task:**

1. Vegetation management on the Movement Corridors will be maintained at 500 to 1,500lbs./acre of RDM (vegetation management on the Conservation Sites is addressed in the LTHMP). Vegetation may occasionally exceed 1,500lbs./acre following the bolt of vegetative growth that grasslands typically experience in the spring, but grazing and/or other management techniques are anticipated to quickly reduce that vegetation back to below 1,500lbs./acre. RDM will be measured and recorded during the spring General Examination. Moderate to heavy livestock grazing in the winter and spring should result in range conditions that are within target RDM levels (Barry et al. 2006). Livestock are generally anticipated to be applied in the fall and will begin removing accumulated thatch that may have been left from the previous year. Livestock will remain present throughout the spring growth period to control grasses and forbs. Generally, livestock will be removed when target RDM levels are achieved in the spring, but livestock may be left on site later in the year to control exotic invasive weeds or problematic late season summer annuals.

Stocking rates will be determined annually in coordination with the Project Administrator and the grazing tenant. The Movement Corridors may be subdivided into smaller blocks using temporary fencing to facilitate the distribution of animals to provide focused, uniform vegetation management. Supplemental water may also be provided to facilitate uniform vegetation management. All of the numbers and dates in this plan are estimates and intended to be used as guidelines to achieve the goals and objectives. The management of this vegetation is weather dependent and methods to achieve the targets will be established by the Project Administrator in consultation with the Qualified Personnel and the grazing tenant. In



the event that RDM levels are not anticipated to exceed the prescribed thresholds and/or weed management by livestock grazing is determined by the Qualified Personnel to not be required, livestock may not be used. Grazing strategies may evolve with time, and be implemented via adaptive management as range science and recommendations from Qualified Personnel may dictate. Other vegetation management techniques and tools (e.g., controlled burns, mowing, hand removal) may be used at the recommendation of the Qualified Personnel, upon coordination with and authorization by the USFWS.

### 3.1.6 INVASIVE EXOTIC PEST SPECIES MANAGEMENT

Plants native to the Project are defined as those plants believed by the scientific community to have been present in Kern County and/or the San Joaquin Valley prior to European settlement. The Jepson Manual (Hickman 1993 and following revisions) can generally be used as a reference in determining if a plant is native or non-native to the San Joaquin Valley sub-region of the Great Valley. Many plant species that are common in California annual grasslands are non-native, but are considered “naturalized,” or do not threaten the habitat values of the Movement Corridors or Conservation Sites. Invasive exotic pest species are defined as plants that are not native, have a tendency to out-compete native vegetation, and negatively affect the habitat values of the Project. The California Invasive Plant Council ([www.CAL-IPC.org](http://www.CAL-IPC.org)) maintains a list of invasive exotic plant species that should be consulted in determining if a plant is a potential management concern. Plants that have a “Red-Alert” or “High” designation shall be treated as invasive exotic pest species.

#### **Objective:**

1. Monitor and maintain control over invasive exotic pest species that diminish habitat quality for the Covered Species.

#### **Task:**

1. The General Examination will include a visual estimate of cover of invasive exotic pest plant species or other non-native species invasions. Large patches (approximately 1,000 sq. ft. or greater) of invasive exotic pest plants will be mapped using a GPS and reported to the Project Administrator. Qualified Personnel will evaluate the identified patch, its likelihood of negatively affecting the habitat values of the project, and its ability to be controlled (e.g., is in the appropriate season and life stage).
2. If it is determined that the invasive exotic pest plant can be controlled, the Project Administrator will coordinate and implement the most effective control measures under the supervision of the Monitoring Biologist, which may include mechanical removal, hand removal, chemical removal, prescribed burns, or targeted grazing in a manner that will avoid disturbance to Covered Species. It may be determined that an invasive, exotic pest plant cannot be controlled that season or year. For instance, when an invasive, exotic pest plant is first identified, it may be determined that it is too late in the season to implement appropriate controls for that species; in which case control measures would need to be postponed to the following season or year. If an invasive is not controlled in a given season or year, a note will

be made in the annual report regarding the size of the patch, the species of interest, the location of the patch, and recommendations for future control. This area will be revisited by Qualified Personnel the following year, evaluated based on the recommendations for future control, and then controlled as appropriate. It is anticipated that during the early years of natural revegetation, invasive species will be common and will not be controlled. Invasive species are a typical component of natural restoration and must be allowed to continue for later seral stages to develop without extensive seeding and restoration of native species (DOI 2005).

3. Scattered tamarisk trees are present on portions of the Project. Individual trees will be removed at the recommendation and supervision of the Monitoring Biologist or other Qualified Personnel. Removal may require the use of chainsaws and/or other heavy machinery (such as a Bobcat compact track loader).

### 3.1.7 HABITAT MONITORING

Most of the Project consists of repeatedly disked lands that do not provide habitat that supports Covered Species. Following the cessation of disking, these lands are anticipated to begin to recover and once again become suitable to support the Covered Species. To track the progression of use by the Covered Species, a two-tiered study approach will be implemented. Tier 1 Studies will consist of broad-based, wide-ranging, cursory surveys to detect the presence of Covered Species on the Project, and are focused solely on determining if the Project is being used by Covered Species. Tier 1 Studies will include pedestrian transect surveys, night spotlighting surveys, evaluations of the use of installed dens, evaluation of the use of installed perches, and verification trapping for small mammals if burrows are encountered. Tier 2 Studies will be used to collect rigorous data on the use of the sites by Covered Species and will provide data that can be used to inform management actions. Tier 2 studies will provide information on the abundance of Covered Species, will quantitatively track changes in habitat conditions, and will provide comparative and replicated data for a statistical analysis.

#### 3.1.7.1 Tier 1 Studies

Tier 1 Studies will be conducted each year on the Solar Sites, Movement Corridors and Conservation Sites, beginning the year after solar facilities have been installed, and will continue until the Solar Sites have been decommissioned. The results of Tier 1 Studies will be included in the annual report. Upon decommissioning, Tier 1 Studies will be replaced with long-term management/monitoring activities as described in the LTHMP.

#### **Objective:**

1. Evaluate the Solar Sites, Conservation Areas, and Movement Corridors to assess the use of these areas by Covered Species and track the expansion of Covered Species.

#### **Task:**

1. Pedestrian survey transects will be conducted throughout the Project to observe use or signs of use by Covered Species and to assess habitat conditions that affect Covered Species. Surveys will be conducted at a rate of one transect every 100 feet on the Project (equivalent

to 53, one mile-long transects per square mile). The configurations of the Movement Corridors are such that only a single transect will be walked along the length of each of the Movement Corridors. Transect surveys will be conducted only when air temperatures are between 77 and 95 degrees Fahrenheit. During these transect surveys, all sightings and diagnostic signs of Covered Species will be noted and other habitat characteristics of note will be qualitatively documented. Transect surveys will be conducted once per survey season, between April 15 and June 30.

2. Night spotlighting for San Joaquin kit fox will be conducted around the perimeter of Project, or if access is not available, around all accessible areas of each site so that the Project receives the maximum amount of visual coverage practicable. Spotlighting will be conducted during three consecutive nights, once each survey season (April 15 to June 30) on each Site of the Project. If San Joaquin kit fox are detected on a Site, further spotlight survey of that Site will be discontinued for that year.
3. All installed dens and perches will be evaluated to determine use by Covered Species. Evaluations will be conducted twice per year, once between April 15 and June 30, and once between August 1 and October 1. All sightings and diagnostic signs of Covered Species will be documented.
4. Species verification trapping for TKR will be conducted in areas where small mammal burrows were observed during pedestrian transect surveys. Trapping will be conducted once each survey season (April 15 to June 30) until a TKR is captured, or for a maximum of three consecutive nights. No more than two representative areas per 320 acres will be trapped. The number of traps deployed will be dependent upon the number and distribution of burrows present and the patch size of the area occupied. Trapping arrays will be deployed according to the best professional judgment of the Monitoring Biologist. As occupied patch sizes increase, additional traps may be needed, up to a maximum of 100 deployed traps per Site. During any given year, no Tier 1 level trapping will be required on portions of the Project where Tipton kangaroo rats have been trapped within Tier 2 Study Plots.

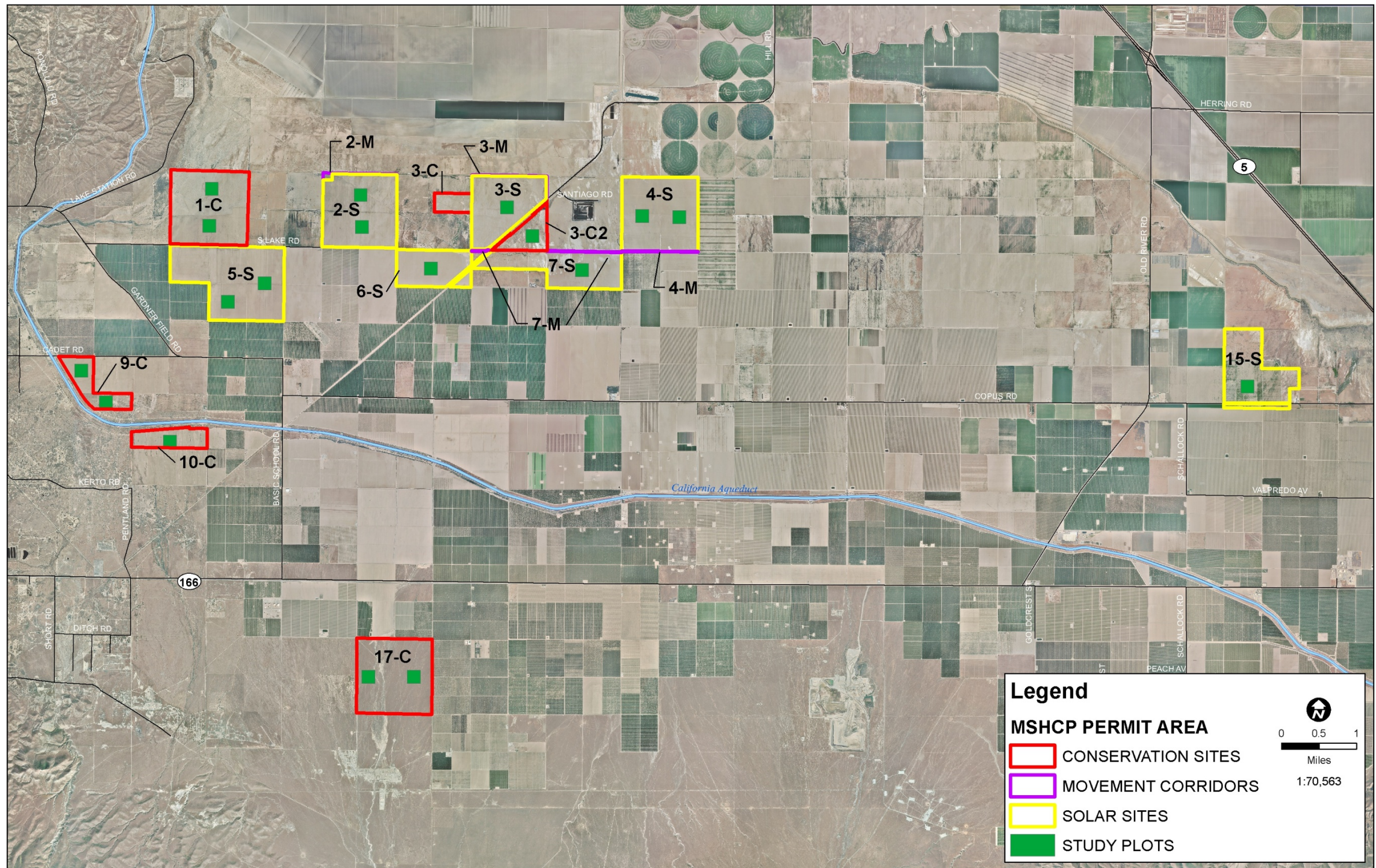
#### *3.1.7.2 Tier 2 Studies*

Tier 2 Studies will be conducted for the first five years following the construction of the Solar Sites, and following the recordation of a conservation easement on the Conservation Sites, and then once every three years until the Solar Sites have been decommissioned. Tier 2 Studies will consist of the establishment of permanent Study Plots, where measurements and observations can be repeatedly taken. A minimum of one Study Plot will be established on each Conservation or Solar Site, and at a maximum rate of one Study Plot per 320 acres. At full Project build-out there will be 18 study plots, totaling 360 acres, established within the Project (Figure 3). The results of Tier 2 Studies will be included in the annual report. Upon decommissioning, Tier 2 Studies will be replaced with long-term management activities as described in the LTHMP.

Each Study Plot will be a 20-acre square, roughly centered within each Conservation or Solar Site (or 320-acre portion thereof), or adjusted based on site conditions according to the best professional judgment of the Monitoring Biologist. Within each Study Plot, plant transects, small mammal trapping lines, bird survey transects and point counts, and reptile transects will be

established. In addition to these plot-specific activities, off-plot activities conducted as part of Tier 2 Studies will include plant transects and track station monitoring. All transects within each Study Plot will be placed at right angles to the solar installations to ensure that each transect encompasses the greatest amount of diversity available on the plot (i.e., both vegetated areas that are anticipated to develop under the solar panels and the non-vegetated maintenance roads situated between the panels). A conceptual Study Plot design is provided (Figure 4). Sampling will be conducted concurrently (within a three-week period) and during the same period annually to minimize temporal variation.

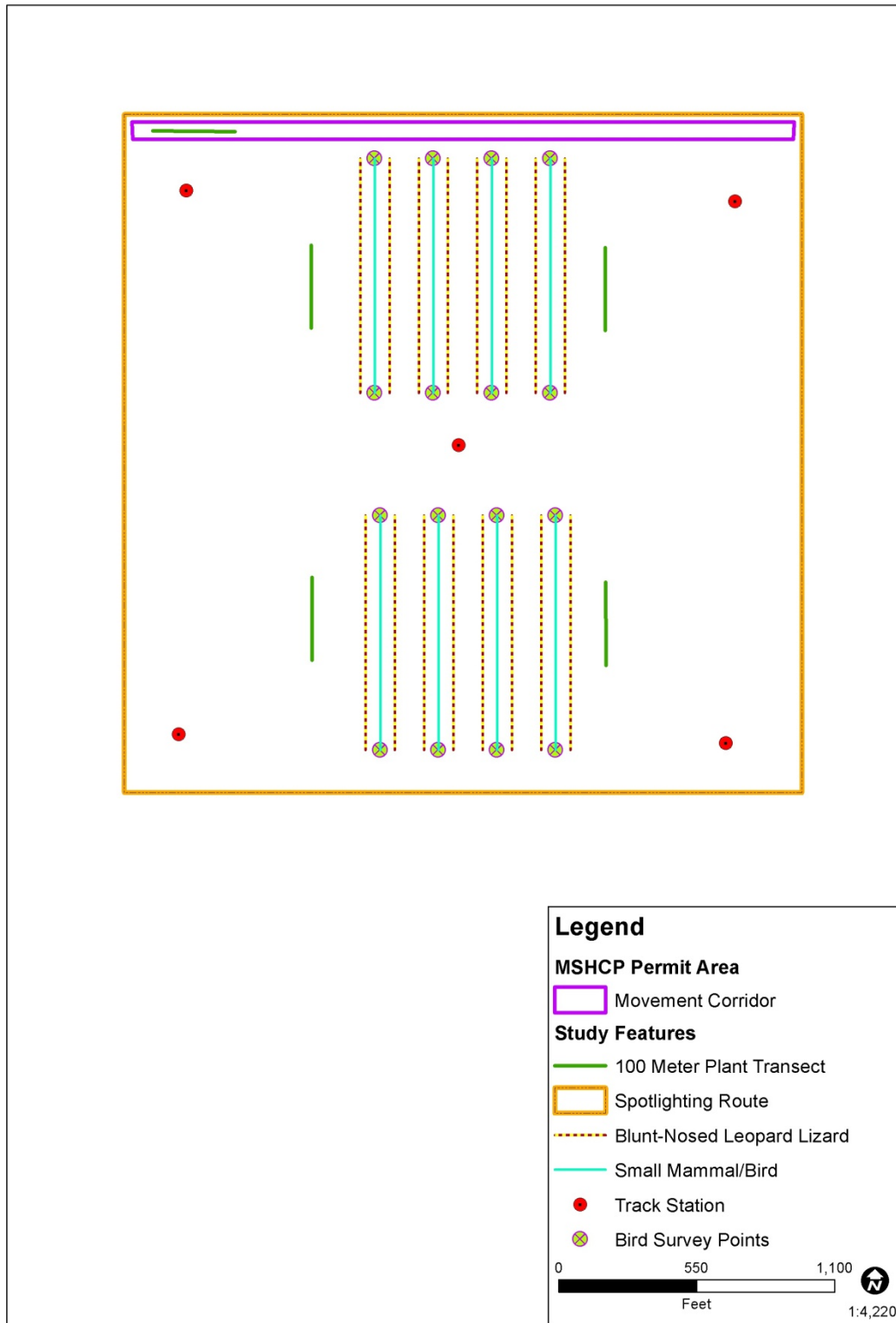




# STUDY PLOT SITE PLAN MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure  
3





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## CONCEPTUAL STUDY PLOT CONFIGURATION FOR LONG-TERM MONITORING STUDIES ON THE COVERED LANDS

Figure  
4

Descriptive statistics (e.g., Student's t-tests, Analysis of Variance) and other relevant statistical analyses will be performed as appropriate using suitable statistical software. Repeated measures analysis will be used to assess temporal changes in vegetation and wildlife use over time and in response to habitat changes. Specific methodologies used for each sampling regime are described below.

**Objective:**

1. Evaluate the Solar Sites, Conservation Areas, and Movement Corridors to assess the use of these areas by Covered Species and track the expansion of Covered Species.

**Task:**

**1. VEGETATION SAMPLING**

Vegetation sampling will be conducted along four, 100-meter long transects. Sampling will occur during the spring of each sampling year. Within the Solar Sites, a stratified random sampling approach will be employed, with each transect divided into two primary categories; areas under solar panels and areas not under solar panels. A simple random sampling approach will be employed on Study Plots established on the Conservation Sites. The following measurements will be taken:

- Annual measurements from ten rectangular vegetation quadrants (35 cm x 70 cm) will be taken from each transect (five under panels and five not under panels on the Solar Sites). All species in each quadrant will be noted, and the percent cover of each species will be estimated using a modified Daubenmire cover scale (Bonham 1989). Total percent cover of all vegetation within the quadrant will be estimated using the same cover scale. When identification to species level is not possible, species will be assigned morpho-species names (e.g., "unknown Atriplex," "unknown with red cotyledons");
- The height and species of annual vegetation and shrubs will be measured annually at points along 1-meter intervals along each transect. The percent shrub cover will be calculated by recording the length of the intersection of shrub canopy along the transect and then dividing that by the length of the transect;
- Representative digital photographs will be taken annually at each end of each plant transect to provide a record of vegetation conditions occurring on each site;
- Two additional 100-meter transects will be established along each of the Movement Corridors and will follow the above protocols; and
- Monthly measurements, taken from January to June, of species composition and cover from two quadrants from each transect will be taken to track species successional patterns following the cessation of disking to better inform future management actions. Information collected will follow the above protocols. Monthly and annual measurements will overlap,

and in that instance, the data will only be recorded once and applied to both measurement tasks.

## **2. SMALL MAMMAL TRAPPING**

Small mammal trapping will be conducted along four trapping lines established on each Study Plot. Trapping will occur in April and October of each sampling year. Each trapping line will be approximately 1,000 feet long, containing 20 traps spaced at 50-foot intervals, resulting in a total of 80 Sherman<sup>TM</sup> live-traps on each plot. Traps will be checked for four consecutive nights each trapping period. Trapping will be conducted as follows:

- Traps will be opened before sunset and baited with a mixture of proso millet, cracked oats, and peanut butter;
- All traps will be checked at approximately 0200 hours and then closed for the night;
- All animals captured will be identified to species. The sex, sexual condition, and weight of each animal will be recorded; and
- Each animal captured will be marked by clipping a patch of fur on its hindquarters to distinguish newly captured animals from recaptures.

## **3. BIRD SURVEYS**

Four bird survey transects will be established on each Study Plot (various transects may overlap) and will be walked for four consecutive survey days in January, April, July, and October of sampling years. Bird observations will be conducted as follows:

- Transects will be surveyed during the first 3.5 hours after sunrise, on days when there is no rain, and the wind speed is below 10 mph;
- Each transect survey will be uniformly time-constrained to standardize the level of search effort expended;
- A biologist familiar with the songs, calls, and visual characteristics of the birds of the region will identify to species every bird seen or heard within 150 feet of each transect line; and
- During the transect surveys, point-counts will be conducted at each end of each transect, with five minutes being spent at each point. All birds seen or heard will be tallied for each point sampled.



#### **4. REPTILE AND NELSON'S ANTELOPE SQUIRREL SURVEYS**

Eight transects per Study Plot, each approximately 1,000 feet long will be established. The transects will be spaced at intervals of approximately 100 feet, and walked for twelve survey days between April 15 and July 15. Herpetofaunal/NAS surveys will be conducted as follows:

- Sampling will be conducted on no more than two periods of four consecutive days each on any given plot;
- Transects will be walked in the morning hours when temperatures are between 77 and 95 degrees F and wind speeds are less than 10 mph;
- Each transect survey will be uniformly time-constrained to standardize the level of search effort expended and will follow standard grid survey protocols (Tollestrup, 1979);
- Qualified Personnel familiar with the herpetofauna of the region and NAS will search the area within 50 feet of each transect for the presence of lizards, other reptiles and NAS; and
- All individuals detected will be identified to species and a GPS location of each animal observed will be recorded.

#### **5. TRACK AND CAMERA STATIONS**

Track and camera stations (Station) will be established throughout the Project. Stations will consist of a 3-foot diameter area covered with fire clay or dolomite, and a digital camera that is activated by an infrared/motion sensitive trigger. Stations will be operated as follows:

- Upon full build-out, 42 Stations will have been established. Additionally, each artificial den will have a “camera-only” Station to determine use of the den by SJKF;
- Each Station will be checked daily for four consecutive days during January, April, July, and October of each monitoring year;
- Each Station will be baited with a tin of cat food that will be replaced as needed; and
- Stations will be inspected daily for tracks and have all digital images will be downloaded. All photographs will be archived and reviewed to produce an inventory of species visiting the Stations.

#### **3.1.8 REVEGETATION**

The disked Movement Corridors and Conservation Sites may require both passive and active restoration. It is anticipated that the disked Sites will naturally re-vegetate following cessation of disking with a variety of native species, including alkali seepweed (*Suaeda* sp.), saltbush

(*Atriplex* sp.), cheeseweed, and various native and non-native annuals (Germano et al. 2012). Seeding may be required to help establish native vegetation within some portions of the Sites. If individual Sites have not been sufficiently recolonized after three growing seasons, native seeds will be planted. The surrounding natural vegetative communities have a relatively low density of native grasses, forbs and shrubs, and the Covered Species are generally associated with low density vegetative communities therefore, the goal is at least a 15 percent cover of native grasses, forbs and shrubs.

In the event that any formerly disked individual Movement Corridor or Conservation Site does not achieve 15 percent native cover following the third year of Tier 2 vegetation monitoring (Section 3.1.7.2), the following seeding measures will be implemented:

- The seed palette for restoration efforts will include a minimum of five species selected from Table 4, with at least one being a shrub species. Other species may be substituted with the recommendation of Qualified Personnel and the approval of the USFWS;
- The native seed will be applied to the Movement Corridors and Conservation Sites via hand-broadcast seeding or the use of a seed drill;
- To hand broadcast:
  - Seed may be mixed with equal parts clean and damp sand to aid in broadcasting;
  - Seed mix is applied in a two-step application, as follows:
    - Step one consists of broadcasting one-half of the seed mix across the planting area in one direction (e.g., north to south); and
    - Step two consists of broadcasting the remaining seed over the same area while moving in a perpendicular direction to step one.
  - Hand broadcast seeding will occur only during low to no wind conditions; and
  - Subsequent to broadcasting, seeds will be worked into the soil with rakes.
- A seed drill may also be used if it is determined by the Qualified Personnel to be the most effective way to apply seeds;
- Supplemental water application, if any, will be applied as determined necessary by the Qualified Personnel, subject to review and approval by the USFWS, and will be based upon weather patterns and soil moisture levels;
- Seeding grasses and forbs in the Central Valley is likely to be most successful in the winter when soils are moist and seeds are poised to undergo spring germination; and
- Seeding rates will be determined based upon the species used and the recommended seeding rates from seed suppliers, generally in the range of 5 to 15 pounds per acre.

**Table 5**  
**Seed Palette, Maricopa Sun Solar Complex Project, Kern County, California**

<b>Forb and Grass Species</b>	<b>Shrub Species</b>
<i>Common spikeweed (Hemizonia pungens)</i>	<i>Seepweed (Suaeda moquinii)</i>
<i>Alkali goldfields (Lasthenia chrysantha)</i>	<i>Valley saltbush (Atriplex polycarpa)</i>
<i>Alkali barley (Hordeum depressum)</i>	<i>Spiny saltbush (Atriplex spinifera)</i>
<i>Peppergrass (Lepidum sp.)</i>	<i>Cheeseweed (Isocoma acedenia)</i>
<i>Small fescue (Vulpia microstachys)</i>	<i>Iodine bush (Allenrolfea occidentalis)</i>

### 3.1.9 DECOMMISSIONING

Decommissioning of the Solar Sites will occur within the 35 year permit term and will involve the removal of solar panels, removal of other power generation infrastructure, and replacement of security fencing with barbed wire fencing as described for the Conservation Sites, etc. Following decommissioning, the Solar Sites and Movement Corridors will be converted to Conservation Sites, at which time they will be managed for Covered Species via the LTHMP.

#### **Objective:**

1. Transition habitat monitoring activities on Project from IHMP to LTHMP.

#### **Task:**

1. Following decommissioning, all habitat management activities associated with this IHMP will be discontinued and the LTHMP will be in-force on the Project, and funded by the endowment.

### 3.1.10 ADAPTIVE MANAGEMENT

Adaptive management is defined as the use of new information gathered from a monitoring program or from other sources to adjust management strategies and practices to improve conservation of a Covered Species (California Fish and Game Code 2805(a)). Adaptive management is important in land management because it allows flexibility in managing a project to achieve the plan goals and objectives. The management tasks identified in this IHMP are based on the current understanding of the Project. As the Project is monitored over time, new data will become available that may trigger changes to the management tasks to improve habitat quality.

The six main steps in adaptive management are:

1. Identification of the problem or management goal;
2. Design of the management action or implementation task(s);
3. Implementation;
4. Monitoring of the results;
5. Evaluation of the results relative to the desired management goals; and
6. Adjustment of management actions.

**Objective:**

1. Maintain flexibility to modify management strategies and methods to ensure that the protected habitats are maintained in good condition such that they will continue to be suitable to support the Covered Species and habitats in perpetuity.

**Task:**

1. The Project Administrator shall consider new technologies and practices to achieve the goal: to preserve the species and habitats for which the MSHCP has been prepared. Adaptation of the methods described in this IHMP must be agreed upon by the Project Administrator and the USFWS. Techniques to address management of new conditions, if not addressed in this IHMP, may be implemented by the Project Administrator upon review and written approval by the USFWS.

### **3.2 Species-specific Objectives and Tasks**

Species-specific objectives and tasks are actions and activities that are intended to specifically enhance habitat conditions for the Covered Species. Some species may have overlapping objectives and tasks.

#### **3.2.1 SAN JOAQUIN KIT FOX**

**Objective:**

1. Provide Movement Corridors that abut four Solar Sites to facilitate the movement of SJKF within and among the Solar Sites.

**Task:**

1. Four 50-foot- wide Movement Corridors, totaling 33.8 acres, abutting Solar Sites 2-S, 3-S, 4-S and 7-S will be designated (Figure 2). The Movement Corridors will be established concurrent with the development of the abutting Solar Sites and upon establishment they will no longer be disked.
2. The Movement Corridors will be enhanced by the installation of 44 artificial dens for SJKF, to serve as escape cover and natal dens. Dens will be created at a rate of 10 per linear mile, with 4 being constructed as natal dens and the remaining 40 being constructed as escape dens. Artificial dens will be constructed according to the designs in Appendix D of the MSHCP.

**Objective:**

2. Provide Conservation Sites to act as dispersal habitat and enhance the Conservation Sites to facilitate SJKF use.

**Task:**

1. Conservation Sites 1-C, 3-C, 3-C2, 9-C, 10-C, and 17-C will be established and permanently protected with a conservation easement recorded in the favor of the Conservation Easement Holder. Conservation Sites will be established as described in the phasing plan (Chapter 8, MSHCP 2014). The Project will progress by six phases (Table 8-2, MSHCP 2014), each incorporating additional solar development lands (onsite lands or Solar Sites) and conservation lands (offsite lands or Conservation Sites). Conservation Sites will be recorded with conservation easements at a final ratio of 0.5:1 of off-site Conservation Sites to Solar Sites. Each of the six phases will provide conservation lands at different ratios (ranging from 0.6:1 up to 0.9:1, with all conservation lands being encumbered prior to Phase 6)). An endowment will be established that will fund the perpetual management of the Conservation Sites. The endowment will be funded in proportion to the acreage that has been established as a Conservation Site.
2. Upon recordation of the Conservation Easement, any disking will be discontinued and permanently prohibited so that vegetation can recolonize the Conservation Site.
3. The Conservation Sites will be enhanced by the installation of 96 artificial dens for SJKF. Dens will be created at a rate of one den per 20 acres, with 9 being constructed as natal dens and the remaining 87 being constructed as escape dens. Artificial dens will be constructed according to the designs in Appendix D of the MSHCP.
4. Following the decommissioning of the Solar Sites, the Solar Sites and Movement Corridors will also be managed as Conservation Sites and be managed for Covered Species..

**3.2.2 TIPTON KANGAROO RAT****Objective:**

1. Preserve existing populations of the TKR within the Permit Area.

**Task:**

1. TKR are known from Conservation Sites 1-C and 9-C. These lands will be permanently protected with a Permanent Conservation Easement (see Section 3.2.1, Objective 2, Task 1, above).

**Objective:**

2. Provide habitat for TKR within the Permit Area.

**Task:**

1. Disking of Conservation Sites will be discontinued and permanently prohibited (see Section 3.2.1, Objective 2, Task 2, above).
2. Portions of Conservation Site 1-C and all of Conservation Sites 3-C, 3-C2 are within flood prone areas within the range of TKR. Topographic relief will be installed in the flood prone areas of the Conservation Sites to provide refugia for TKR in the event of flood flows. Topographic relief will be created using tractors or other heavy machinery at Conservation Sites 1-C and 3-C at a rate of 10 percent cover (total of 26.76 acres combined for Conservation Sites 1-C and 3-C), consisting of shallow depressions (approximately one foot below grade) and raised areas (approximately 6 inches above grade). Conservation Site 3-C2 has not been disked in approximately 6 years and has had substantial recolonization by plant and animal species. Topographic relief will be created on Conservation Site 3-C2 only in areas that avoid small mammal burrows and that would remove patches of weedy vegetation. Prior to the installation of topographic relief on Conservation Site 3-C2, the Site will be inspected by the Monitoring Biologist and the Project Administrator for conditions that are suitable for topographic relief installation. Topographic relief will not be installed if, in the judgment of the Monitoring Biologist, Conservation Site 3-C2 has had sufficient recolonization such that installation of topographic relief would either not be feasible or would cause more harm than benefit.
3. Solar Sites will become Conservation Sites upon decommissioning (see Section 3.2.1, Objective 2, Task 1, above).

**3.2.3 NELSON'S ANTELOPE SQUIRREL****Objective:**

1. Preserve existing populations of NAS within the Permit Area.

**Task:**

1. NAS are known from Conservation Site 9-C, and may be present on Conservation Site 17-C, which contains saltbush scrub habitat. These lands will be permanently protected with a conservation easement as described above in Section 3.2.1, Objective 2, Task 1.

**Objective:**

2. Provide habitat for NAS within the Permit Area.

**Task:**

1. Disking of Conservation Sites will be discontinued and permanently prohibited (see Section 3.2.1, Objective 2, Task 2, above).

2. Topographic relief will be installed for TKR (see Section 3.2.2, Objective 2, Task 2, above), which is anticipated to also benefit NAS.
3. Solar Sites will become Conservation Sites upon decommissioning (see Section 3.2.1, Objective 2, Task 1, above).

#### 3.2.4 WESTERN BURROWING OWL

##### **Objective:**

1. Preserve existing populations of the WEBO within the Permit Area.

##### **Task:**

1. WEBO are known from both Conservation Sites and Solar Sites. The owls occurring on the Solar Sites are transient foragers, are not associated with burrows or dens, and do not breed on the Solar Sites. All of the Conservation Sites either currently support breeding western burrowing owls, or will have the habitat features necessary to support breeding WEBO following the cessation of disking. The Conservation Sites will be permanently protected with a conservation easement as described above in Section 3.2.1, Objective 2, Task 1.

##### **Objective:**

2. Provide habitat for WEBO within the Permit Area.

##### **Task:**

1. Disking of Conservation Sites will be discontinued and permanently prohibited (see Section 3.2.1, Objective 2, Task 2, above).
2. Topographic relief will be installed for TKR (see Section 3.2.2, Objective 2, Task 2, above), which is also anticipated to benefit WEBO.
3. Perching posts constructed from T-posts will be installed on both the Conservation Sites and the Movement Corridors. Perching posts will consist of a cut, 2-foot long section of post welded to the top of each T-post at a right angle to the main post. Perching posts will be installed on the Conservation Sites at a rate of one per 20 acres (96 posts). Perching posts will be installed on the tops of berms in the Movement Corridors at a rate of 8 perching posts per mile (36 posts) and will co-occur with 25 percent of the artificial dens (Section 3.2.1, Objective 2, Task 3, above).
4. Solar Sites will become Conservation Sites upon decommissioning (see Section 3.2.1, Objective 2, Task 1, above).

### 3.2.5 BLUNT-NOSED LEOPARD LIZARD

#### **Objective:**

1. Preserve existing populations of the BNLL within the Permit Area.

#### **Task:**

1. BNLL are assumed present on the portions of Conservation Site 9-C that contains saltbush scrub habitat. These lands will be permanently protected with a conservation easement as described above in Section 3.2.1, Objective 2, Task 1.

#### **Objective:**

2. Provide habitat enhancements for BNLL within the Permit Area.

#### **Task:**

1. Disking of Conservation Sites will be discontinued and permanently prohibited (see Section 3.2.1, Objective 2, Task 2, above).
2. Topographic relief will be installed for TKR (see Section 3.2.2, Objective 2, Task 2, above), which is also anticipated to benefit BNLL.
3. Solar Sites will become Conservation Sites upon decommissioning (see Section 3.2.1, Objective 2, Task 1, above).

## 4.0 REPORTING AND ADMINISTRATION

### 4.1 *Reporting*

The Project Administrator, in conjunction with the Qualified Personnel, will be responsible for preparing and submitting (through Project Administrator) an annual report to the USFWS, with a copy to the Conservation Easement Holder, within 30 days following the end of each calendar year. Reporting will be done according to the conditions of the MSHCP (Chapter 5, MSHCP 2014).

During the life of the Project, the IHMP and the LTHMP will have overlapping reporting requirements. It is anticipated that the reporting requirements for both plans will be combined into a single report for efficiency in preparation and Agency review.



## **4.2 Administration**

### **4.2.1 NOTIFICATION**

The Project Administrator shall be responsible for providing notification to the USFWS for any activities requiring Agency review and approval as described in the MSHCP (Chapter 2, MSHCP 2014).

### **4.2.2 EMERGENCIES**

The Project Administrator is responsible for identifying emergency situations that require immediate action, as described in the MSHCP (Chapter 2, MSHCP 2014).

## **5.0 TRANSFER, REPLACEMENT, ADMENDMENTS, NOTICES**

### **5.1 Transfer**

The Project Administrator shall notify and receive approval from the USFWS of any subsequent transfer of responsibilities under this IHMP to a different Project Administrator. Any subsequent Project Administrator will then assume all Project Administrator responsibilities described in this IHMP, unless otherwise amended in writing and approved by the USFWS.

### **5.2 Replacement**

If the Project Administrator fails to implement the tasks described in this IHMP and is notified of such failure in writing by the USFWS, the Project Administrator shall have 90 days to cure such failure. If failure is not cured within 90 days, the Project Administrator may request a meeting with the USFWS to resolve the failure. Such meeting shall occur within 30 days, or a longer period if approved by the USFWS.

### **5.3 Amendments**

The Project Administrator and the USFWS may occasionally meet at the request of any one of them, to revise the IHMP to refine the areas covered by the IHMP, or to better meet management objectives and preserve the habitat and conservation values of the Permit Area. Any proposed changes to the IHMP shall be discussed by the USFWS and the Project Administrator. Any proposed changes will be designed with input from all parties. Amendments to the IHMP shall be approved by the USFWS in writing, shall be required management components, and shall be implemented by the Project Administrator.

If the USFWS determines in writing that continued implementation of this IHMP would jeopardize the continued existence of a federally-listed species, any written amendment to this IHMP that is determined by the USFWS as necessary to avoid jeopardy, shall be a required management component and shall be implemented by the Project Administrator.

## 5.4 Notices

Any notices regarding this IHMP should be directed as follows:

**Project Administrator:**

Maricopa Sun, LLC  
Contact: Jeffery Roberts  
1396 W. Herndon Avenue, Suite 101  
Fresno, CA 93711  
(559) 439-0900

**Approving Resource Agency:**

United States Fish and Wildlife Service  
Contact: Justin Sloan, San Joaquin Valley Branch  
2800 Cottage Way, Suite W-2608  
Sacramento, CA 95825  
(916) 414-6600

## 6.0 REFERENCES

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[http://www.wcc.nrcs.usda.gov/ftpref/support/climate/soil-nar/ca/Kern\\_\(SW\).doc](http://www.wcc.nrcs.usda.gov/ftpref/support/climate/soil-nar/ca/Kern_(SW).doc)

# DRAFT LONG-TERM HABITAT MANAGEMENT PLAN

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## MARICOPA SUN SOLAR COMPLEX PROJECT, KERN COUNTY, CALIFORNIA

March 2014

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Quad Knopf

# **DRAFT LONG-TERM HABITAT MANAGEMENT PLAN**

## **Maricopa Sun Solar Complex Project, Kern County, California**

### **Prepared for:**

Maricopa Sun, LLC  
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**March 2014**

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## 1.0 INTRODUCTION

The Maricopa Sun Solar Complex will be constructed within a 5,784.3-acre Permit Area, located in southwestern Kern County. Upon full build out, the Maricopa Sun Solar Complex project will result in a combination of Solar Sites (consisting of photovoltaic panels, inverters, transformers, transmission lines and other associated infrastructure), Movement Corridors (areas managed to facilitate wildlife movement around the Solar Sites), and Conservation Sites (areas managed to provide habitat for wildlife)(land types collectively, Project).

This Long-Term Habitat Management Plan (LTHMP) describes the ecological and resource management actions that will take place on the Conservation Sites, following the recordation of a Conservation Easement on each Conservation Site. The Conservation Easement will be recorded in favor of an approved 501c(3) non-profit conservation group (Conservation Easement Holder). Conservation Sites are anticipated to be added to and managed according to this LTHMP as the various Solar Sites are developed. Following decommissioning (described further herein), the Solar Sites and Movement Corridors will be converted to Conservation Sites and then also be managed according to this LTHMP.

### **Project Administrator:**

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## 1.1 Background

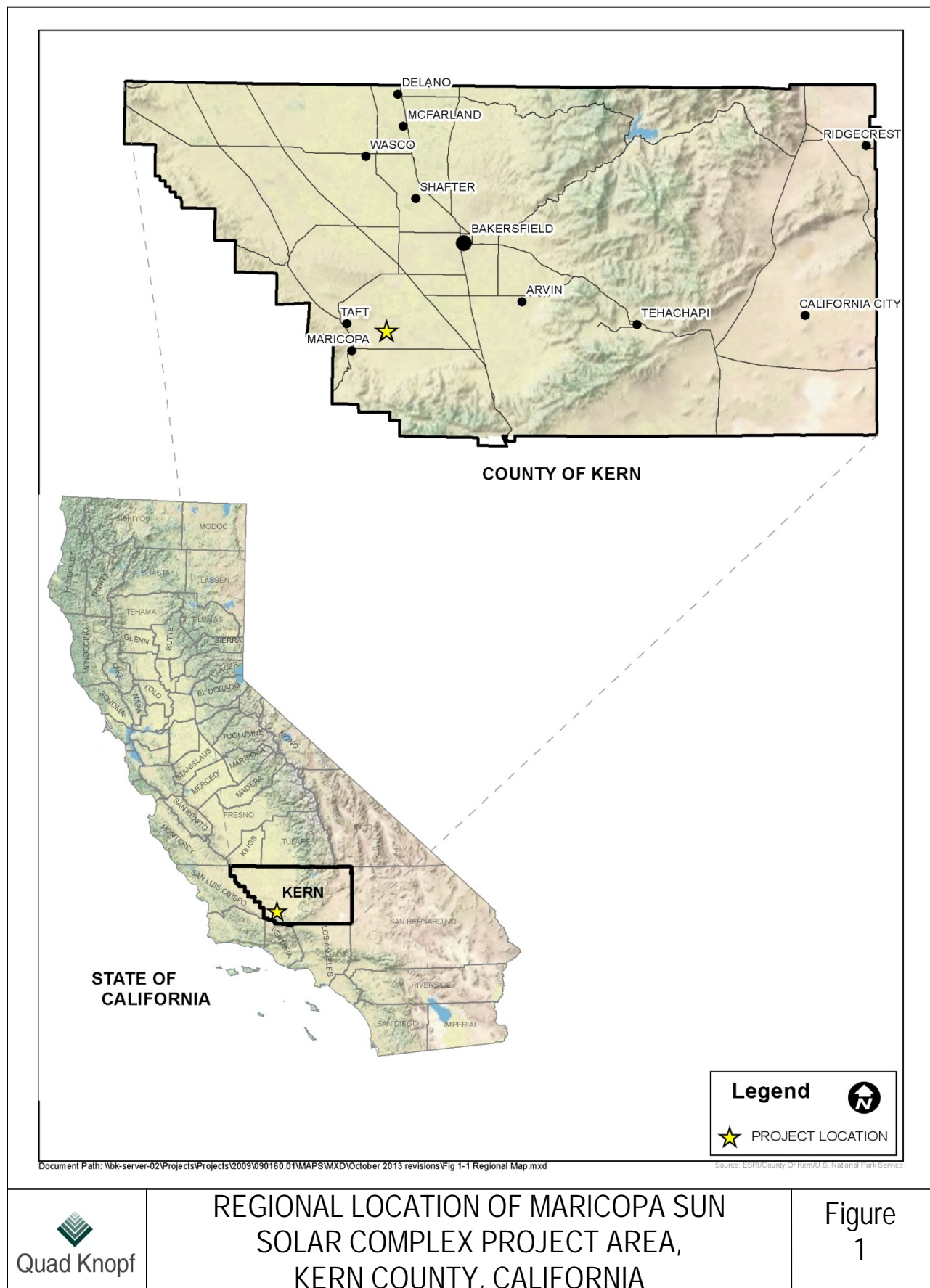
The Maricopa Sun Solar Complex is located in southwestern Kern County (Figure 1) and will result in the creation of three different land types (Figure 2): Solar Sites, which will include the photovoltaic panels and associated infrastructure; Movement Corridors, which are areas designed to facilitate wildlife movement around the Solar Sites; and Conservation Sites, which will be permanently conserved and managed as wildlife habitat, concurrent with the development of the Solar Sites (all land types collectively called Project). The Project will be phased and is anticipated to take approximately 10-15 years to reach full build-out. The solar production phase of the Project is anticipated to last approximately 35 years. This LTHMP and the MSHCP (Maricopa Sun, LLC Habitat Conservation Plan 2014) associated with the Project is being developed for incidental take coverage for San Joaquin kit fox (*Vulpes macrotis mutica*), Tipton kangaroo rat (*Dipodomys nitratooides*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), western burrowing owl (*Athene cunicularia*), and blunt-nosed leopard lizard (*Gambelia sila*)(collectively, "Covered Species").

Maricopa Sun, LLC (Project Administrator) is the Permittee for the Project and will maintain an ongoing administrative role in all phases and aspects of the Project, including ongoing habitat management for the Conservation Sites. Any transfer of ownership or administrative obligations of the Conservation Sites will be approved in writing by the United States Fish and Wildlife Service (USFWS).

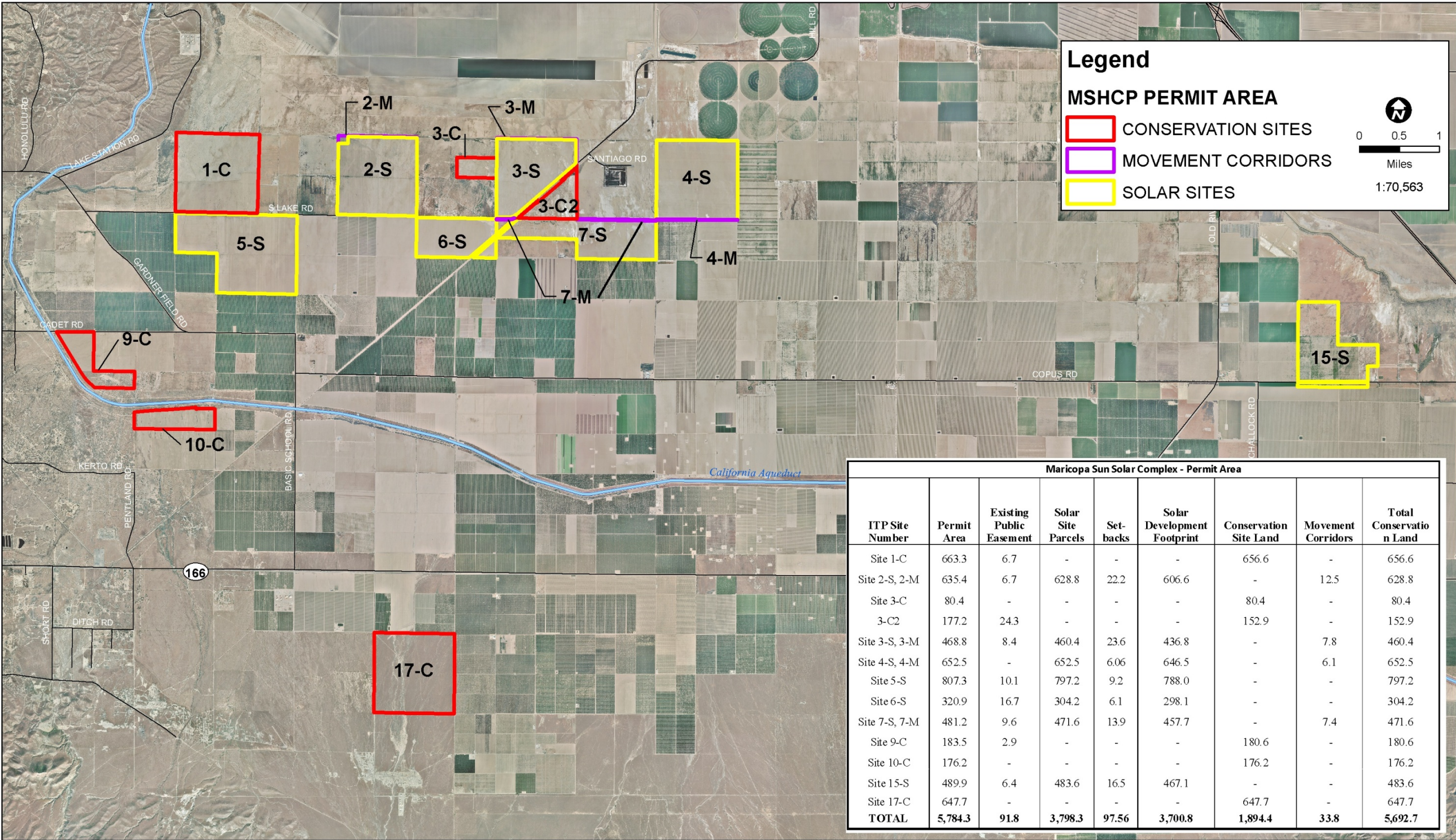
## 1.2 Scope and Purpose

The purpose of this LTHMP is to ensure that the Conservation Sites are managed, monitored and maintained in perpetuity. This LTHMP establishes objectives, priorities and tasks to monitor, manage, maintain, and report upon the Covered Species and habitats on the Conservation Sites. The Project will be phased; thus, various ecological management activities may begin and end at different times throughout the life of the Project. The LTHMP differs from the Interim Habitat Management Plan (IHMP) in that the LTHMP describes activities that will commence with the recordation of the Conservation Easement on a particular property, will be limited to the Conservation Sites, and will continue on in perpetuity, whereas the IHMP will commence with the development of a Solar Site, will have activities on all three land types (Solar Sites, Movement Corridors, and Conservation Sites; individual parcels within the Permit Area without respect to land types are Sites), and will last for the duration of the Project/MSHCP (Table 1). The purpose of having two plans that are run concurrently is to account for the temporary enhancement actions and increased studies associated with the MSHCP, and at the same time









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SITE PLAN  
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure  
2



describe the mitigation actions that will continue in perpetuity on the Conservation Sites. This also provides for a distinction in funding, where IHMP activities will be funded directly or indirectly by the Project Administrator and LTHMP activities will be paid for by the interest generated from the funded endowment account.

**Table 1**  
**Management Plan Comparison**

	<b>Interim Habitat Management Activities</b>	<b>Long-term Habitat Management Activities</b>
Starting Action	Upon development of Solar Site	Upon recordation of Conservation Easement on Conservation Sites
Duration	35 years/Permitted life of Project	Perpetuity
Land Types	Solar Sites, Movement Corridors, Conservation Sites	Conservation Sites (will cover all sites following decommissioning of Solar Sites)

The IHMP and the LTHMP will be implemented conjunctively and thus have management activities that overlap (e.g., annual reporting, trash removal, species monitoring). For activities where the IHMP and LTHMP overlap, the activity will be paid for initially via the funding of the IHMP. Following the completion of overlapping activities, the Project Administrator may bill the endowment associated with the LTHMP (assuming that the endowment has the funds accumulated and available) to recover the cost of the overlapping activities. This LTHMP is a binding and enforceable instrument, implemented by the Conservation Easement covering the Conservation Sites.

### **1.3 Phasing**

The Project is anticipated to be constructed over the course of the next 10-15 years as market demands and interest dictate (additional details regarding Project Phasing can be found in Chapter 8 of the MSHCP 2014). The construction of solar facilities on the Solar Sites precipitates the conservation of a proportionate amount of the Conservation Sites and the designation of Movement Corridors, where applicable. The Project has an anticipated 35-year lifespan (Interim Period), at which point the Solar Sites will be decommissioned and the solar facilities removed. The future development of the Solar Sites will be limited by a “Springing” Conservation Easement that will be in effect following the conclusion of the term of the MSHCP. The idea of a “springing conservation easement” is that the lands intended for conservation will be managed for another purpose (as Solar Sites) during an initial timeframe (i.e., the Interim Period) and then, once the Interim Period is complete (following decommissioning), will “spring” into effect as conservation lands under the Conservation Easement. Following decommissioning, the Solar Sites will be protected and managed for Covered Species and become subject to the LTHMP. Any capital ecological improvements required for the Solar Sites, as the decommissioned Solar Sites are transitioned to management via the LTHMP, will be paid for via the IHMP.

## 2.0 PROJECT DESCRIPTION

### 2.1 *Geography, Topography, Climate*

The Permit Area is located approximately five miles east of the City of Taft in an unincorporated portion of southwestern Kern County, generally along South Lake Road and Old River Road, east of Gardner Field Road. The Permit Area is made up of multiple, non-contiguous parcels totaling 5,784.3 acres. Three of the Conservation Sites are located approximately 2-5 miles south of South Lake Road, where the majority of the Sites are located.

The Permit Area lies just north of the Transverse Ranges, near the base of the San Emigdio Mountains, east of the Temblor Range and south of the historic southern shore of Buena Vista Lake. The Permit Area lands are level, consisting predominantly of disked, fallowed agricultural fields, levees, berms and roadways, with some Conservation Sites being ruderal land or naturalized/native habitat. Elevations within the Permit Area range from approximately 320 feet above mean sea level (AMSL) to the east to 900 feet AMSL to the south. Low undulating relief remains on parcels within the Permit Area that are disked, but they have not been laser leveled nor do they retain their natural topography.

The Permit Area has a Mediterranean climate, with cool wet winters and hot dry summers. The average high temperatures are 48.5 degrees Fahrenheit in the winter and 94.8 degrees Fahrenheit in the summer. The average annual precipitation is 6.32 inches, falling predominantly as rain. The prevailing wind is from the west-northwest, with highest wind speeds in April and May, averaging 7.7 miles per hour (USDA, 2009).

### 2.2 *Surrounding Land Use*

Lands adjacent to the Permit Area consist predominantly of active agricultural cultivation, including permanent tree crops (e.g., almonds, cherries), row and field crops (e.g., carrots, alfalfa), actively disked fallowed ground, and uncultivated grasslands used for grazing. The uncultivated grazing ground consists of natural or naturalized grasslands habitats, and in some areas provides connectivity to the Buena Vista Hills to the west and San Emigdio Mountains to the south. The grasslands to the west and south also are used for oil production and are associated with the Midway Sunset Oil Field and the Naval Petroleum Reserve.

### 2.3 *Soils*

The soils on the Permit Area are highly variable, consisting of 9 different soil types (see Table 2).

### 2.4 *Hydrology*

The only significant active hydrologic feature near the Permit Area is the Kern River, about 11 miles to the north. Several smaller blue-line streams flow out of the San Emigdio Mountains to the south and the Transverse Range to the west, all terminating at Buena Vista Lake. Portions of

the Permit Area are also mapped by the Federal Emergency Management Agency as being within the 100-year floodplain. Santiago Creek, a named blue-line feature, flows through Conservation Site 17-C, and several other unnamed blue-line features are mapped throughout the Permit Area. Santiago Creek is a likely, though unconfirmed, “Water of the U.S” as defined by the Clean Water Act. The only verified wetlands or waters that occur on the Permit Area that are under federal authority are a 2.55-acre wetland area located in the extreme northwest corner of Solar Site 2-S, and a Water of the U.S. occurring on Conservation Site 1-C. The remaining hydrologic features in the vicinity of the Permit Area consist of man-made water conveyance facilities, such as irrigation ditches, canals and the California Aqueduct.

**Table 2**  
**Soil Types Occurring Throughout the Maricopa Sun Solar Complex**

<b>Location</b>	<b>Soil Type Present</b>
<b>Site 1-C</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 153-Tupman gravelly sandy loam (0-2 percent slopes), 160-Fages clay (0-1 percent slopes), and 352-Posochanet-Posochanet (partially reclaimed association, 0-1 percent slopes)
<b>Site 2-S, 2-M</b>	133-Calflax loam (0-1 percent slopes) and 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
<b>Site 3-S, 3-M</b>	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
<b>Site 3-C</b>	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
<b>Site 3-C2</b>	133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
<b>Site 4-S, 4-M</b>	133-Calflax loam (0-1 percent slopes) and 350-Posochanet silt loam (saline-sodic, 0-1 percent slopes)
<b>Site 5-S</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 150-Excelsior sandy loam (0-2 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 152-Excelsior loam (0-2 percent slopes)
<b>Site 6-S</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
<b>Site 7-S, 7-M</b>	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
<b>Site 9-C</b>	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 150-Excelsior sandy loam (0-2 percent slopes)
<b>Site 10-C</b>	132/134-Cerini loam (0-2 percent slopes/2-5 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
<b>Site 15-S</b>	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic; 0-2 percent slopes), and 160-Fages clay (0-1 percent slopes)
<b>Site 17-C</b>	134-Cerini loam (0-2 percent slopes) and 192-Guijarral-Klipstein complex (2 -5 percent slopes)

## 3.0 HABITATS AND SPECIES

### 3.1 *Habitats*

The habitat type on the Permit Area consists predominantly of disked, fallowed farmland. All of the Solar Sites and Movement Corridors and some of the Conservation Sites (1-C, 3-C and a portion of 9-C) are disked regularly to maintain the Sites free of vegetation. Conservation Site 17-C and an approximately 80 acre portion of Conservation Site 9-C appear to be un-disked, retain their natural topography and have vegetation consisting of a mixed non-native annual grassland and saltbush scrub mosaic consistent with other surrounding natural areas. Conservation Site 3-C2 was disked approximately 6 years ago and appears to be in the process of returning to an annual grassland.

The disked portions of the Permit Area provide very little habitat value for plants and wildlife. Regular disking prevents the colonization of plants and animals, and because the sites remain fallow, there is no wildlife benefit from the production of agricultural crops. These disked fields only provide open space which allows for movement of wildlife across the fields and marginal foraging opportunities when adjacent to parcels that contain natural communities.

The un-disked Conservation Sites (both intact and recovering) provide significant habitat value and connectivity to local plant and wildlife communities. Much of the surrounding area, as well as the broader San Joaquin Valley, has been converted to agricultural production or urban development. This development has reduced the acreage of native habitat and reduced the populations of native plants and wildlife. These un-disked Conservation Sites, as well as the other Conservation Sites following the cessation of disking, provide critical refugia for native plants and wildlife and contribute to the persistence of these species. Additional detail on the habitat types and species found on and adjacent to the Permit Area can be found in Chapter 3 and Appendix G of the MSHCP.

### 3.2 *Conservation and Endangered Species Recovery Value*

The Permit Area, upon construction, will immediately begin to contribute to the recovery of species. Concurrent with the start of development, a proportional amount of the Conservation Sites will be protected with Conservation Easements, have endowments to ensure long-term management, and will be monitored and managed for their habitat values. Further, the Solar Sites will be managed in a way that does not preclude wildlife and endangered species colonization. The Solar Sites, while in energy production, will likely provide some habitat value to the Covered Species, but they are anticipated to be colonized by plant and wildlife species, which will result in an increase in locally available habitat over the previously disked condition. Upon decommissioning, the Solar Sites will have the energy production facilities and infrastructure removed, and the Solar Sites and Movement Corridors will become Conservation Sites and managed for their habitat values.

The various land types within the Permit Area will contribute to the recovery of species to varying degrees during the energy production life of the Project. The Conservation Sites (and the remainder of the Project following decommissioning) contribute to the following recovery

priorities and tasks as outlined in the Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998):

1. Recovery Task 2.1.4 (Priority 1) – Protection of large blocks of land in Western Kern County;
2. Recovery Task 3.2.22 (Priority 3) – Multispecies animal surveys for upland vertebrates, southwestern Valley edge;
3. Recovery Task 4.26 (Priority 1) – Monitoring/Studies on dispersal, movement, diet, reproduction, use of agricultural fields, use of artificial dens for San Joaquin kit fox;
4. Recovery Task 5.3.8 (Priority 2) – Protection of linkage areas around the San Joaquin Valley edge; and
5. Recovery Task 6 (Priority 3) – Apply adaptive management to protected areas.

The Project will contribute to the large matrix of protected land that already exists in western Kern County, and will add to the growing corridor of habitat that connects the Wind Wolves Preserve with the Naval Petroleum Reserve. The Project will also contribute to the creation of an east-west corridor of protected land that will connect the historic southern lake shores of Buena Vista and Kern Lakes.

### 3.3 Sensitive Species and Vegetation Communities

Western Kern County is a well-known and important area for sensitive San Joaquin Valley endemic species. While most of the Permit Area is disked and does not support any species, many sensitive species and sensitive vegetation communities are known from the area (see Table 3).

**Table 3**  
**Sensitive Species and Vegetation Communities**

Scientific Name	Common Name	Status
<b>Sensitive vegetative communities</b>		
Great Valley Cottonwood Riparian Forest	Great Valley Cottonwood Riparian Forest	Protected under CEQA
Great Valley Mesquite Scrub	Great Valley Mesquite Scrub	Protected under CEQA
Valley Sacaton Grassland	Valley Sacaton Grassland	Protected under CEQA
Valley Saltbush Scrub	Valley Saltbush Scrub	Protected under CEQA
Valley Sink Scrub	Valley Sink Scrub	Protected under CEQA
<b>Plants</b>		
<i>Allium howellii</i> var. <i>clokeyi</i>	Mt. Pinos onion	1B.3
<i>Astragalus hornii</i> var. <i>hornii</i>	Horn's milk-vetch	1B.1
<i>Atriplex cordulata</i>	Heartscale	1B.2
<i>Atriplex tularensis</i>	Bakersfield smallscale	CE, 1B.1
<i>Atriplex coronata</i> var. <i>vallicola</i>	Lost Hills crownscale	1B.2
California ( <i>Erodium</i> ) <i>macrophyllum</i>	round-leaved filaree	1B.1
<i>Caulanthus californicus</i> ( <i>Stanfordia californica</i> )	California jewel-flower	FE, CE, 1B.1
<i>Caulanthus coulteri</i> var. <i>lemmonii</i>	Lemmon's jewelflower	1B.2
<i>Cirsium crassicaule</i>	slough thistle	1B.1
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	Hispid bird's beak	1B.1

**Table 3**  
**Sensitive Species and Vegetation Communities (Continued)**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Status</b>
<i>Delphinium recurvatum</i>	recurved larkspur	1B.2
<i>Eremalche kernensis</i>	Kern mallow	FE, 1B.1
<i>Eriastrum hooveri</i>	Hoover's eriastrum	4.2
<i>Eschscholzia lemmonii</i> ssp. <i>kernensis</i>	Tejon poppy	1B.1
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	1B.1
<i>Layia hetereotricha</i>	Pale-yellow layia	1B.1
<i>Layia leucopappa</i>	Comanche Point layia	1B.1
<i>Monardella linoides</i> ssp. <i>oblonga</i>	Tehachapi monardella	1B.3
<i>Monolopia congdonii</i>	San Joaquin woollythreads	FE, 1B.2
<i>Stylocline citroleum</i>	oil neststraw	1B.1
<b>Invertebrates</b>		
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT
<i>Euproserpinus euterpe</i>	Kern primrose sphinx moth	FT
<b>Fishes</b>		
<i>Hypomesus transpacificus</i>	Delta smelt	FT, CT
<b>Amphibians</b>		
<i>Rana aurora draytonii</i>	California red-legged frog	FT
<i>Spea hammondi</i>	western spadefoot	CSC
<b>Reptiles</b>		
<i>Actinemys marmorata pallida</i>	western pond turtle	CSC
<i>Anniella pulchra pulchra</i>	silvery legless lizard	CSC
<i>Gambelia sila</i>	blunt-nosed leopard lizard	CE, FE, CDFW fully protected
<i>Masticophis flagellum ruddocki</i>	San Joaquin whipsnake	CSC
<i>Phrynosoma blainvillii</i>	California horned lizard	CSC
<i>Thamnophis gigas</i>	giant garter snake	FT, CT
<b>Birds</b>		
<i>Agelaius tricolor</i>	tricolored blackbird	CSC
<i>Athene cunicularia</i>	western burrowing owl	CSC
<i>Buteo swainsoni</i>	Swainson's hawk	CSC
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	FT
<i>Charadrius montanus</i>	mountain plover	CSC
<i>Circus cayaneus</i>	Northern harrier	CSC
<i>Coccyzus americanus occidentalis</i>	western yellow-billed cuckoo	CE
<i>Dendrocygna bicolor</i>	fulvous whistling-duck	CSC
<i>Elanus leucurus</i>	white-tailed kite	CDFW fully protected
<i>Eremophila alpestris actia</i>	California horned lark	CDFW watch list
<i>Falco mexicanus</i>	prairie falcon	CDFW watch list
<i>Gymnogyps californianus</i>	California condor	FE, CE
<i>Lanius ludovicianus</i>	Loggerhead shrike	CDFW watch list
<i>Plegadis chihi</i>	white-faced ibis	CDFW watch list
<i>Toxostoma lecontei</i>	Le Conte's thrasher	CSC
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	CSC
<b>Mammals</b>		
<i>Ammospermophilus nelsoni</i>	Nelson's antelope squirrel	CT
<i>Dipodomys ingens</i>	giant kangaroo rat	FE, CE
<i>Dipodomys nitratoideus brevinasus</i>	short-nosed kangaroo rat	CSC
<i>Dipodomys nitratoideus nitratoideus</i>	Tipton kangaroo rat	FE, CE
<i>Eumops perotis californicus</i>	western mastiff bat	CSC
<i>Onychomys torridus tularensis</i>	Tulare grasshopper mouse	CSC



**Table 3**  
**Sensitive Species and Vegetation Communities (Continued)**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Status</b>
<i>Perognathus inornatus inornatus</i>	San Joaquin pocket mouse	CSC, BLMS
<i>Sorex ornatus relictus</i>	Buena Vista Lake shrew	FE
<i>Taxidea taxus</i>	American badger	CSC
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	FE, CT

### **Status Definitions**

FE	Federally Endangered
CE	California Endangered
1B.1	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Seriously Endangered in California
1B.2	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Fairly Endangered in California.
1B.3	California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Not Very Endangered in California
4.2.	Plants of limited distribution - Watch list, Fairly endangered in California (20-80% occurrences threatened)

## **4.0 MANAGEMENT AND MONITORING**

This section of the LTHMP describes the ecological management, monitoring and adaptive management activities that are anticipated to be conducted on the Conservation Sites. The LTHMP will be administered by the Project Administrator as outlined in this plan, but actual management activities may be performed by a separate management entity as authorized by the USFWS. Funding for the implementation of this LTHMP will be provided by the Maricopa Sun Solar Complex Endowment.

### **4.1 Goals and Objectives**

The primary biological goal of this LTHMP and of the broader MSHCP (Maricopa Sun, LLC MSHCP 2014, Chapter 5), is to preserve the species and habitats for which the MSHCP has been prepared.

This goal is realized by accomplishing the following objectives:

- Maintaining an ability of San Joaquin kit fox (SJKF) to disperse through the Permit Area and within the region;
- Preserving existing populations of the Tipton kangaroo rat (TKR) within the Permit Area, and providing habitat for the TKR within the Permit Area;
- Preserving existing populations of the Nelson's antelope squirrel (NAS) within the Permit Area, and providing habitat for the NAS within the Permit Area;
- Preserving existing populations of the western burrowing owl (WEBO) within the Permit Area, and providing habitat for the WEBO within the Permit Area;
- Providing habitat for the blunt-nosed leopard lizard (BNLL) within the Permit Area.

## 4.2 Management and Personnel

The Project Administrator, and subsequent Project Administrators upon transfer, shall administer this LTHMP, managing and monitoring the Conservation Sites in perpetuity to preserve the habitat and conservation values in accordance with the Conservation Easements and the LTHMP. The specific tasks outlined in this LTHMP will be implemented by the Project Administrator or Qualified Personnel and are described in Section 3, below.

When appropriate, the Project Administrator shall retain professional biologists, grazing managers, machinery operators or other specialists to conduct specialized tasks (Qualified Personnel). The Monitoring Biologist is one of the Qualified Personnel, and shall be familiar with California flora and fauna and shall have knowledge regarding the ecology of the San Joaquin Valley and the habitats of the Conservation Sites and the region. Qualified Personnel shall have a valid Section 10(a)(1)(a) permit for the appropriate species, when tasks require activities that would normally require such a permit (e.g., trapping for Tipton kangaroo rat). The Project Administrator may also serve as Qualified Personnel when qualified and where appropriate.

General administration of this LTHMP is the responsibility of the Project Administrator and implementation of this LTHMP is the responsibility of the Project Administrator. The Project Administrator will work with the Monitoring Biologist and other Qualified Personnel to ensure that all tasks are completed. The Project Administrator, Monitoring Biologist, and other Qualified Personnel will work together as a team to implement the LTHMP by exchanging information, problem solving and generally having a proactive relationship. If the Project Administrator changes, the incoming and outgoing personnel will tour the Conservation Sites together, and the former will inform the latter of trends and, problem areas, review past annual reports, and identify any administrative issues.

Duties of the Monitoring Biologist may include, but are not limited to:

- Conducting biological surveys, collecting data, preparing reports required by this LTHMP;
- Evaluating conditions on the Conservation Sites and recommending actions to the Project Administrator;
- Identifying and reporting opportunities and needs for adaptive management actions to the Project Administrator;
- Conducting thatch/exotic plant management activities when necessary, with the Project Administrator.

Other Qualified Personnel may be responsible for tasks such as:

- Implementing vegetation management activities like grazing, chemical control application, or mechanical removal; and

- Performing specialized studies on implementing adaptive management actions.

### **4.3 Biological Resources**

The overall goal of this LTHMP is to foster the long-term viability of the habitat values of the Conservation Sites and the Covered Species that use the Conservation Sites. Routine monitoring and maintenance tasks are intended to assure the viability of the Conservation Sites in perpetuity, and provide the information necessary to implement adaptive management activities.

The long-term management of the Conservation Sites' biological resources will include regular examinations of the Conservation Sites, monitoring of selected characteristics to determine stability of habitats, and identifying ongoing trends and adaptive management opportunities. The Qualified Personnel, including the Monitoring Biologist, selected to perform these monitoring responsibilities, will have the knowledge, training, and experience to accomplish these tasks.

The Project Administrator shall implement the following:

#### **4.3.1 BIOLOGICAL EXAMINATIONS**

Regular Biological Examinations will help ensure the integrity of the habitat on the Conservation Sites. The goal of the Biological Examination is to regularly observe the habitats of the Conservation Sites and to qualitatively track trends in those habitats.

##### **Objective:**

1. Perform Biological Examinations of the Conservation Sites.

##### **Task:**

1. Biological Examinations shall occur twice annually (once in the spring and once in the fall) by Qualified Personnel, and will focus on an evaluation of the habitats on the Conservation Sites. The entire perimeters of the Conservation Sites will be observed, and meandering transects will be conducted through the entirety of the Conservation Sites to gather qualitative information. This information will be used to track changes in habitat, any observations or evidence of Covered Species, important vegetation changes, or other observations relevant to management of the Conservation Sites.
2. Two permanent Photo-Points will be established on each Conservation Site. The Photo-Points will be located at points that provide accurate general representations of conditions across the Conservation Site. Photographs will be taken in the four cardinal directions from each Photo-Point.
3. All observations will be recorded and included in the annual report.

## 4.3.2 VEGETATION EXAMINATIONS

Vegetation Examinations on the Conservation Sites will consist of vegetation height measurements to determine Residual Dry Matter (RDM). The goal of the Vegetation Examination is to measure and track the effectiveness of the vegetation management activities as described in Section 4.3.3, below, so that the Conservation Sites continue to provide habitat for the Covered Species. The Covered Species generally prefer landscapes with low vegetation and scattered shrubs; thus, the habitats on the Conservation Sites will be managed as such for the benefit of the Covered Species.

### **Objective:**

1. Perform Vegetation Examinations of the Conservation Sites.

### **Task:**

1. Vegetation Examinations shall occur twice annually (once in the spring and once in the fall) by Qualified Personnel. Vegetation Examination points will be collocated with the permanent Photo-Points described in Section 3.1.1, above. Vegetation height will be measured at 10 random points within a 20-foot radius of the Photo-Point. An average vegetation height will be calculated for each point, which will be used to estimate RDM (Bartolome et al. 2002).

### *4.3.2.1 Invasive Exotic Pest Species Management*

Plants native to the Conservation Sites will be defined as those plants believed by the scientific community to have been present in Kern County and/or the San Joaquin Valley prior to European settlement. The Jepson Manual (Hickman 1993 and following revisions) may generally be used as a reference in determining if a plant is native or non-native to the San Joaquin Valley sub-region of the Great Valley. Many plant species that are common in California annual grasslands are non-native, but are considered “naturalized” or do not threaten the habitat values of the Conservation Sites. Invasive exotic pest species are plants that are not native, have a tendency to out-compete native vegetation, and negatively affect the habitat values of the Conservation Sites. The California Invasive Plant Council ([www.CAL-IPC.org](http://www.CAL-IPC.org)) maintains a list of invasive exotic plant species that should be consulted in determining if a plant is a potential management concern. Plants that have a “red-alert” or “high” designation shall be treated as invasive exotic pest species.

### **Objective:**

1. Monitor and maintain control over invasive exotic pest species that diminish habitat quality for the Covered Species.

### **Task:**

1. The Biological Examination will include a visual estimate of cover of invasive exotic pest plant species or other non-native species invasions. Large patches (approximately 1,000 sq.

ft. or greater) of invasive exotic pest plants will be mapped using a GPS, and reported to the Project Administrator. The Project Administrator and Qualified Personnel will evaluate the identified patch, its likelihood of negatively affecting the habitat values of the Conservation Sites, and its ability to be controlled (e.g., control is performed during the appropriate season and life stage).

2. If it is determined that the invasive exotic pest plant can be controlled, the Project Administrator will coordinate and implement the most effective control measures under the supervision of the Monitoring Biologist, which may include mechanical removal, hand removal, chemical removal, prescribed burns, or targeted grazing in a manner that will avoid disturbance to Covered Species. It may be determined that an invasive, exotic pest plant cannot be controlled that season or year. For instance, when an invasive, exotic pest plant is first identified, it may be determined that it is too late in the season to implement appropriate controls for that species; in which case control measures would need to be postponed to the following season or year. If an invasive is not controlled in a given season or year, a note will be made in the annual report regarding the size of the patch, the species of interest, the location of the patch, and recommendations for future control. This area will be revisited by Qualified Personnel the following year, evaluated based on the recommendations for future control, and then controlled as appropriate. It is anticipated that during the early years of natural revegetation, invasive species will be common and will not be controlled. Invasive species are a typical component of natural restoration and must be allowed to continue for later seral stages to develop without extensive seeding and restoration of native species (DOI 2005).
3. Scattered tamarisk trees are present on some Conservation Sites. Individual trees will be removed at the recommendation and supervision of the Monitoring Biologist of other Qualified Personnel. Removal may require the use of chainsaws and/or other machinery (such as a Bobcat compact track loader).

#### 4.3.3 VEGETATION MANAGEMENT

The primary goal of vegetation management activities is to maintain vegetation, especially herbaceous cover, in a manner that benefits the Covered Species. The Covered Species are most often associated with desert grassland/shrubland habitats that have low topographic relief and sparse shrub cover. Dense or tall vegetation can inhibit the movement of the Covered Species, and can make predator detection and avoidance more difficult (USFWS 1998).

Livestock grazing is anticipated to be the primary means of vegetation management on the Conservation Sites. Moderate to heavy livestock grazing in the winter and spring should result in range conditions that are within target RDM levels (Barry et al. 2006). Livestock are generally anticipated to be applied in the fall, and will begin removing accumulated thatch that may have been left from the previous year. Livestock will remain present throughout the spring growth period to control grasses and forbs. Generally livestock will be removed when target RDM levels are achieved in the spring, but livestock may be left on site later in the year to control exotic invasive weeds or problematic late season summer annuals.

Stocking rates will be determined annually in coordination with the Project Administrator and the grazing tenant. The Conservation Sites may be subdivided into smaller blocks using temporary or permanent fencing to facilitate the distribution of animals or provide for more targeted vegetation management. Supplemental water may also be provided to facilitate uniform vegetation management. All of the numbers and dates in this plan are estimates and intended to be used as guidelines to achieve the goals and objectives. The management of this vegetation is weather dependent, and methods to achieve the targets will be established by the Project Administrator in consultation with the Qualified Personnel and the grazing tenant. In the event that RDM levels are not anticipated to exceed the prescribed thresholds and/or weed management by livestock grazing is determined by the Qualified Personnel to not be required, livestock may not be used. Grazing strategies may evolve with time, and be implemented via adaptive management as range science and recommendations from Qualified Personnel may dictate. Other vegetation management techniques and tools (e.g., controlled burns, mowing, hand removal) may be used at the recommendation of the Qualified Personnel, upon coordination with and authorization by the USFWS.

**Objective:**

1. Manage vegetation on the Conservation Sites to be 500 to 1,500 lbs./acre of RDM.

**Task:**

1. Vegetation on the Conservation Sites will be maintained at 500 to 1,500 lbs./acre of RDM. Vegetation may occasionally exceed 1,500 lbs./acre following the bolt of vegetative growth that grasslands typically experience in the spring, but grazing and/or other management techniques are anticipated to quickly reduce that vegetation back to below 1,500lbs./acre.

#### 4.3.4 COVERED SPECIES MONITORING

Regular monitoring of the Covered Species on the Conservation Sites will enable the Project Administrator and other Qualified Personnel to better understand the use of the Conservation Sites by the Covered Species, and make management recommendations and adaptive management changes.

##### 4.3.4.1 San Joaquin Kit Fox

**Objective:**

1. Monitor the use of the Conservation Sites by SJKF.

**Task:**

1. Once every 3 years, concurrent with the BNLL pedestrian surveys (Section 4.3.4.5, below), incidental observations of evidence of SJKF will be conducted on the Conservation Sites. The surveys are intended to note any evidence of SJKF use of the Conservation Sites, including dens, tracks, latrine sites, etc. All observations of SJKF individuals and sign will be recorded and used to inform priority areas for spotlighting surveys.

2. Spotlighting surveys will be conducted for one night, once each survey season following the pedestrian surveys. The spotlighting surveys will be conducted by driving the perimeter of each Conservation Site (as practicable) and through the Conservation Sites (as necessary), such that the visual coverage of the spotlighting is maximized and is consistent with good professional judgment of the Monitoring Biologist. Prioritization of SJKF survey effort will be directed towards areas where the species' sign was noted during the pedestrian surveys. Except for the duration, spotlighting surveys will follow the methodology described in Appendix 1, Section 1 of the SJKF Survey Protocol (USFWS 1999). All SJKF individuals or sign will be recorded and included in that year's annual report.

#### *4.3.4.2 Tipton Kangaroo Rat*

##### **Objective:**

1. Monitor the use of the Conservation Sites by TKR.

##### **Task:**

1. Once every 3 years, concurrent with the BNLL pedestrian surveys (Section 4.3.4.5, below), incidental observations of evidence of kangaroo rats will be conducted on the Conservation Sites, on those Sites that are within the range of the species. The surveys are intended to note any evidence of kangaroo rat use of the Conservation Sites, including burrows, tracks, scat, etc. All kangaroo rat sign will be recorded and used to inform priority areas for live-trapping.
2. Trapping will be conducted for three nights, once each survey season following the pedestrian surveys. At least one trap line will be monitored per 320 acres of Conservation Site. The number of traps deployed will be dependent upon the number and distribution of burrows present and the patch size of the area occupied. Traps will be deployed according to the best professional judgment of the Monitoring Biologist. Except for the duration, live-trapping will follow the methodology described in Survey Protocol for Determining the Presence of San Joaquin Kangaroo Rats (USFWS 2013). All TKR individuals or sign will be recorded and included in that year's annual report.

#### *4.3.4.3 Nelson's Antelope Squirrel*

##### **Objective:**

1. Monitor the use of the Conservation Sites by NAS.

##### **Task:**

1. Once every 3 years, concurrent with the BNLL pedestrian surveys (Section 4.3.4.5, below), incidental observations of NAS will be conducted on the Conservation Sites. All NAS individuals or presumed sign (e.g., tracks and scat) will be recorded and included in that year's annual report.

#### *4.3.4.4 Western Burrowing Owl*

##### **Objective:**

1. Monitor the use of the Conservation Sites by WEBO.

##### **Task:**

1. Once every 3 years, concurrent with the BNLL pedestrian surveys (Section 4.3.4.5, below), incidental observations of WEBO will be conducted on the Conservation Sites. All WEBO individuals or presumed sign (e.g., tracks, white wash, prey remains, and pellets) will be recorded and included in that year's annual report.

#### *4.3.4.5 Blunt Nosed Leopard Lizard*

##### **Objective:**

1. Monitor the use of the Conservation Sites by BNLL.

##### **Task:**

1. Once every three years, a single complete visual coverage pedestrian survey for BNLL will be conducted on the Conservation Sites. Surveys will be conducted in the spring/summer, following standard time and temperature constraints (CDFG 2004). The surveys are intended to monitor the use of the Conservation Sites by BNLL. The Conservation Sites also have a low density of shrub vegetation; thus, transects will be walked at 30-meter intervals (approximately 53 transects linear mile). All BNLL individuals or presumed sign will be recorded and included in that year's annual report.

## **4.4 Conservation Site Maintenance**

The long-term maintenance and protection of the Conservation Sites' resources will include annual examinations of the Conservation Sites. Annual examination will involve monitoring of infrastructure (fencing, signage, etc.) to determine and manage threats to the stability of habitats, and to identify ongoing trends and adaptive management opportunities. The Qualified Personnel selected to perform these monitoring responsibilities will have the knowledge, training, and experience to accomplish these responsibilities.

The Project Administrator shall implement the following:

### **4.4.1 GENERAL EXAMINATIONS**

Regular General Examinations will help ensure the integrity of the habitat on the Conservation Sites. The goal of the General Examination is to regularly observe the habitats of the Conservation Sites and to qualitatively track trends in the management of those habitats.



**Objective:**

1. Perform General Examinations of the Conservation Sites.

**Task:**

1. General Examinations shall occur twice annually (once in the spring and once in the fall) by Qualified Personnel, and will focus on the management of the habitats and infrastructure (fencing, signage, etc.) on the Conservation Sites. All perimeters of the Conservation Sites will be observed, and meandering transects will be conducted through the entirety of the Conservation Sites to gather qualitative information. This information will be used to track any observations or evidence of management concerns or obligations relevant to the management of the Conservation Sites. All observations will be recorded and included in the annual report.

#### 4.4.2 TRASH AND TRESPASS

**Objective:**

1. Monitor and Repair Sources of Trash and Trespass.

**Task:**

1. During each General Examination, Qualified Personnel shall record occurrences of trash and/or trespass. Records shall include record type, location, and management/mitigation recommendations to avoid, minimize, or rectify trash and/or trespass impact. Any observations of trash or trespass that cannot be removed or repaired by the observer will be noted and reported to the Project Administrator.
2. At least once yearly, Qualified Personnel shall collect and remove trash and repair and rectify vandalism and/or trespass impact to the maximum degree practicable to protect the conservation values of the Project.

#### 4.4.3 FIRE HAZARD REDUCTION

**Objective:**

1. Reduce the potential for the Conservation Sites to be fire hazards.

**Task:**

1. If at any time, conditions at the Conservation Sites become a fire hazard (as determined or requested by the Kern County Fire Department) the Project Administrator will work with the USFWS and the local fire authorities to determine the best method to reduce the fire risk.

#### 4.4.4 FENCES, GATES AND SIGNS

Initial fencing and signage will be installed on the Conservation Sites per the IHMP. Maintenance of the fencing and signage will be required in this LTHMP.

**Objective:**

1. Maintain fencing and signage to discourage unauthorized access.

**Task:**

1. A minimum of three-strand barbed wire fencing shall be installed around the perimeter of each Conservation Site, with the bottom wire being barbless to contribute to the permeability of the fence for larger animals like the SJKF. At least one gate will be maintained on each Conservation Site to provide access for monitoring, maintenance, and emergency personnel. Per the IHMP, upon decommissioning of the Solar Sites, the security fence will be removed and replaced with fencing as described above for Conservation Sites, which will then be monitored according to this LTHMP.

Signage that discourages public access and informs the public of the protection of the habitat values of the Conservation Sites will be maintained around the perimeter of the Conservation Sites at a rate of no less than 3 signs per mile. Signs will be maintained on the perimeter fencing to the maximum degree practicable, but may be installed on free-standing posts where appropriate.

2. Perimeter fencing, signage and gates will be inspected at least twice annually during the General Examinations, but fencing is anticipated to be casually observed during many of the associated LTHMP activities. All issues related to the integrity of the fencing, signage or gates shall be immediately reported to the Project Administrator and Project Administrator shall make repairs as soon as practicable. The Project Administrator is responsible for the repair, maintenance and replacement of all fencing, as well as ensuring that all gates remain locked to prevent unauthorized access. Additional temporary or permanent fencing may be added for maintenance purposes, grazing control, adaptive management activities, etc. Plans for changes in fencing alignment or additional fencing in the coming year will be noted in the prior year's annual report or following discussion with the USFWS.

Access to the Conservation Sites will be prohibited, except for activities described in this LTHMP, the IHMP, and the MSHCP. Access to the Conservation Sites in emergency or law-enforcement situations by medical, fire or law enforcement personnel and vehicles is allowed. Except in cases where the USFWS determines that immediate entry is required to prevent, terminate or mitigate a violation of this LTHMP, access to the Conservation Sites will be provided to the USFWS with 48 hours of notice.

#### 4.4.5 EROSION

**Objective:**

1. Reduce erosion that negatively affects habitat values.

**Task:**

1. If it is determined during the General Examination that drainage is causing any erosion or other adverse effects that threaten the habitat value of the Conservation Sites, the Project Administrator will be notified and erosion control measures will be implemented.

#### 4.5 *Decommissioning*

Decommissioning of the Solar Sites will occur within 35 years of permit issuance, and will involve the removal of solar panels, removal of other power generation infrastructure, the replacement of security fencing with barbed wire fencing for Conservation Sites, etc. Following the completion of the decommissioning, the Solar Sites and the Movement Corridors will become Conservation Sites, will be managed for Covered Species. The funding necessary for the management of the Solar Sites and Movement Corridors under the LTHMP will come from a supplemental endowment contribution that was placed with the Endowment Holder prior to construction and allowed to grow with compounding interest. This supplemental endowment funding will be added to the endowment following the end of the MSHCP term.

**Objective:**

1. Manage the Solar Sites and Movement Corridors as Conservation Sites following decommissioning.

**Task:**

1. Following decommissioning, all habitat management activities associated with the IHMP will be discontinued and the LTHMP will be in-force on the Project and funded by the Endowment Account.

#### 4.6 *Adaptive Management*

Adaptive management is defined as the use of new information gathered from a monitoring program or from other sources to adjust management strategies and practices to improve conservation of a Covered Species (California Fish and Game Code 2805(a)). Adaptive management is important in land management, because it allows flexibility in managing the Conservation Sites to achieve the plan goals and objectives. The management tasks identified in this LTHMP are based on the current understanding of the Conservation Sites. As the Conservation Sites are monitored over time, new data will become available that may trigger changes to the management tasks to improve habitat quality.

The six main steps in adaptive management are:

1. Identification of the problem or management goal;
2. Design of the management action or implementation task(s);
3. Implementation;
4. Monitoring of the results;
5. Evaluation of the results relative to the desired management goals; and
6. Adjustment of management actions.

**Objective:**

1. Maintain flexibility to modify management strategies and methods to ensure that the protected habitats are maintained in good condition such that they will continue to support the Covered Species and habitats in perpetuity.

**Task:**

1. The Project Administrator shall consider new technologies and practices to achieve the goal: to preserve the species and habitats for which the MSHCP has been prepared. Adaptation of the methods described in this LTHMP must be agreed upon by the Project Administrator and the USFWS. Techniques to address management of new conditions, if not addressed in this LTHMP, may be implemented by the Project Administrator upon review and written approval by the USFWS.

## ***4.7 Conservation Easement Monitoring***

The Conservation Easement Holder will conduct one monitoring visit each year to document compliance with the terms of the Conservation Easement. A report will be prepared and submitted to the USFWS annually within 30 days of the end of each calendar year. If the Conservation Sites are observed to not be in compliance with the terms of the Conservation Easement, the Conservation Easement Holder shall immediately contact the Project Administrator for remedy and the non-compliance and remedy will be included in that years Conservation Easement Holder report. If the non-compliance is not resolved to the satisfaction of the Conservation Easement Holder, the Conservation Easement Holder will notify the USFWS.

## ***4.8 Reporting and Administration***

### **4.8.1 REPORTING**

The Project Administrator, in conjunction with the Qualified Personnel, will be responsible for preparing and submitting an annual report to the USFWS with a copy to the Conservation Easement Holder within 30 days of the end of each calendar year. At a minimum, each annual report will include the following:

- A summary and map of all Conservation Sites;

- A list and map of all Conservation Sites that were protected with Conservation Easements and the corresponding funding contributed to the Endowment Account;
- A description of all maintenance and management activities completed during the year of the report;
- A description of all maintenance and management activities anticipated to be completed in the next year;
- Photographs documenting the habitats of the Conservation Sites as well as any dens and perching posts;
- A summary of all findings from biological monitoring and any other incidental observations;
- Any additional habitat enhancement measures deemed warranted;
- Any problems that require near-, short-, or long-term attention (e.g., invasive exotic pest plant removal, erosion control, trespass);
- Any adaptive changes in the monitoring or management program that appear to be warranted based on monitoring results to date; and
- A description of actions for which USFWS notification or approval was not needed, but were carried out during the year.

During the life of the Project, the IHMP and the LTHMP will have overlapping reporting requirements. It is anticipated that the reporting requirements for both plans will be combined into a single report for efficiency in preparation and USFWS review.

## 4.8.2 ADMINISTRATION

### 4.8.2.1 Notification

The Project Administrator shall be responsible for providing notification to the USFWS for any activities requiring USFWS review and approval. All efforts will be made to outline the activities for the coming 12 months in the annual report. If this is not possible, the Project Administrator will submit a separate letter to the USFWS with a written description of the activity, including when the activity will take place and what methodology will be used, as well as a map showing what areas will be targeted. The USFWS will have 30 days to contact the Project Administrator to discuss the activity if they do not approve. If the Project Administrator is not contacted within 30 days, the activity will be considered approved. Notification will be made either by fax, email, registered mail, or overnight transmittal.

### 4.8.2.2 Emergencies

The Project Administrator is responsible for identifying emergency situations that require immediate action. Should an emergency situation arise that requires immediate action and would

normally require that the USFWS be notified or have review and approval authority, the Project Administrator shall notify the USFWS verbally within forty-eight (48) hours, with written confirmation of the actions taken within five (5) business days. In these situations, “emergency” is a situation that would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship.

Should an emergency situation arise that requires immediate action in a wetland or waters of the U.S., but would normally require that a permit be obtained from the United States Army Corps of Engineers (ACOE), the Project Administrator shall notify the ACOE verbally within twenty-four (24) hours regarding the situation and the actions taken. The ACOE will be notified in writing of the actions taken and further actions (if any) proposed within five (5) business days. The Project Administrator will work with the ACOE to determine what, if any, further actions are necessary. The following applies as stated in the Code of Federal Regulations, Title 33, Chapter II, Part 325, Section 325.2 – Processing of Applications:

Emergency procedures – Division engineers are authorized to approve special processing procedures in emergency situations. An “emergency” is a situation which would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unseen, and significant hardship if corrective action requiring a permit is not undertaken within a time period less than the normal time needed to process the application under standard procedures.

California Fish and Game Code Section 1600 also has emergency procedure stipulations that may apply.

If an emergency situation does arise, the Project Administrator, Qualified Personnel, and the USFWS will meet to discuss the emergency situation. Management or monitoring changes will be coordinated by the Project Administrator, Qualified Personnel, and the USFWS, and be implemented based upon priority and available funding.

## **5.0 TRANSFER, REPLACEMENT, AMENDMENTS, AND NOTICES**

### **5.1 *Transfer***

The Project Administrator shall notify and receive approval from the USFWS of any subsequent transfer of responsibilities under this LTHMP to a different Project Administrator. Any subsequent Project Administrator will then assume all Project Administrator responsibilities described in this LTHMP, unless otherwise amended in writing and approved by the USFWS.

### **5.2 *Replacement***

If the Project Administrator fails to implement the tasks described in this LTHMP and is notified of such failure in writing by the USFWS, the Project Administrator shall have 90 days to cure such failure. If failure is not cured within 90 days, the Project Administrator may request a

meeting with the USFWS to resolve the failure. Such meeting shall occur within 30 days or a longer period if approved by the USFWS.

### **5.3 Amendments**

The Project Administrator and the USFWS may meet and confer from time to time, at the request of any of them, to revise the LTHMP, to refine the areas covered by the LTHMP, or to better meet management objectives and preserve the habitat and conservation values of the Conservation Sites. Any proposed changes to the LTHMP shall be discussed by the USFWS and Project Administrator. Any proposed changes will be designed with input from all parties. Amendments to the LTHMP shall be approved by the USFWS in writing, shall be required management components, and shall be implemented by the Project Administrator.

If the USFWS determines, in writing, that continued implementation of this LTHMP would jeopardize the continued existence of a federally-listed species, any written amendment to this LTHMP, determined by the USFWS as necessary to avoid jeopardy, shall be a required management component and shall be implemented by the Project Administrator.

### **5.4 Notices**

Any notices regarding this LTHMP should be directed as follows:

**Project Administrator:**

Maricopa Sun, LLC  
Contact: Jeffery Roberts  
1396 W. Herndon Avenue, Suite 101  
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**Approving Resource Agency:**

United States Fish and Wildlife Service  
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(916) 414-6600

## **6.0 FUNDING AND TASK PRIORITIZATION**

### **6.1 Funding**

The annual cost of monitoring and managing the Conservation Sites according to this LTHMP will be funded through the Endowment Account, held and managed by the Endowment Holder. The Endowment Account will be held in an interest-bearing account, such that the principal in the Endowment Account will generate sufficient interest to pay for the implementation of this

LTHMP without drawing down the principal. The principal deposit necessary to manage the Conservation Sites is calculated using a “PAR-like” analysis.

The Project Administrator may use the interest generated by the Endowment Account to pay for activities associated with the management and operation of the LTHMP and the Conservation Sites in general. This may include, but is not limited to monitoring, maintenance, property taxes, contracts, equipment, fencing, signs, etc. Annual disbursements from the Endowment Account shall begin one full year following the full funding of the Endowment Account. The Endowment Account obligations, the management obligations described in this LTHMP, and the obligations under the Conservation Easement shall continue in perpetuity as a covenant running with the Conservation Sites. These costs include estimates of time and funding needed to conduct the basic monitoring site visits and reporting, habitat maintenance, trash removal, fence and sign repair, and a prorated calculation of funding needed to fully replace the fencing every 35 years.

The Endowment Account will be funded with a principal amount of \$5,017,059.55 dollars (MSHCP, Chapter 10, Section 10.3.3). The estimated cost for the implementation of the LTHMP was determined by a PAR-like analysis. This analysis is used to determine the amount of funding necessary to establish a non-wasting Endowment, from which, the interest generated will be sufficient to implement the LTHMP. Individual Developers will be responsible for funding a portion of the Endowment as determined by the Project Administrator.

The LTHMP will initially be implemented on only the Conservation Sites, then, following decommissioning, the Solar Sites and Movement Corridors will also be managed for their habitat values according to the terms of the LTHMP. The Endowment will therefore be funded in two primary intervals; the Initial Funding will be sufficient for the management of the Conservation Sites, and then Supplemental Funding will be added to the Endowment to extend LTHMP management activities to the decommissioned Solar Sites and Movement Corridors. The Supplemental Funding will be placed in a separate interest bearing account where it will grow until the end of the term of the MSHP and then combined with the Initial Funding Endowment for the implementation of LTHMP activities on the Project.

## **6.2    *Prioritization***

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The Project Administrator and the USFWS shall discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order: 1) required by a local, state, or federal agency; 2) tasks necessary to maintain or remediate habitat quality; and 3) tasks that monitor resources, particularly if past monitoring has not shown downward trends. Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the USFWS and as authorized by the USFWS in writing.



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## **Artificial Den Designs**

### Escape Dens (Fig. 1)

Designed to provide escape cover for kit foxes.

Dens consist of a 10-20 ft long length of pipe placed on the surface of the ground and covered with several inches of dirt to provide thermal insulation.

### Chambered Dens (Fig. 2)

Designed to provide escape cover and diurnal resting cover for kit foxes, and also provides a chamber for resting or reproduction.

Dens consist of a chamber buried approximately 3 ft deep with two 5-7 ft long entrance pipes leading into the den box.

## **Artificial Den Materials**

### Escape Dens and Den Tunnels

8"-diameter PVC pipe or corrugated plastic pipe

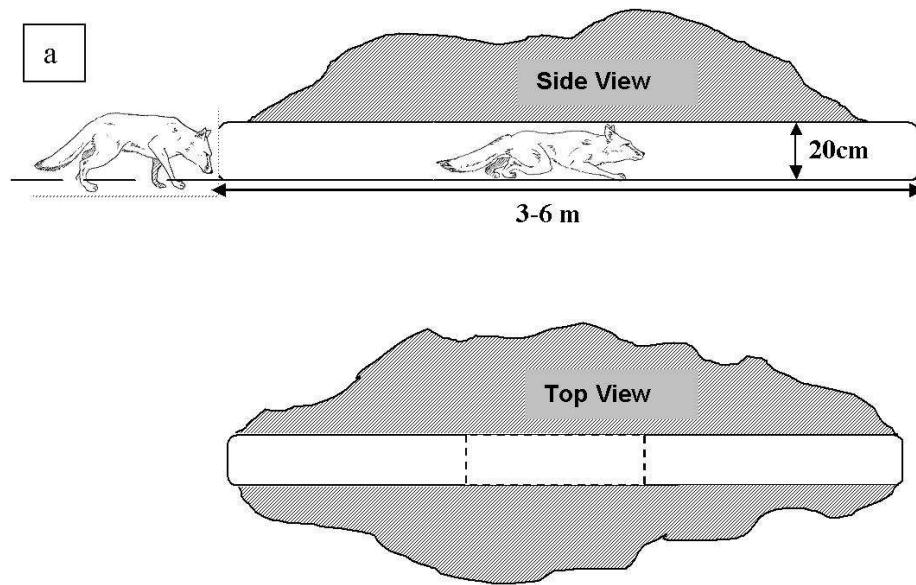
Strips can be cut from the bottom of the pipes to facilitate drainage.

### Den Chambers

Plastic irrigation valve boxes (approximately 20-30" long, 15-20" wide, 15-20" tall)

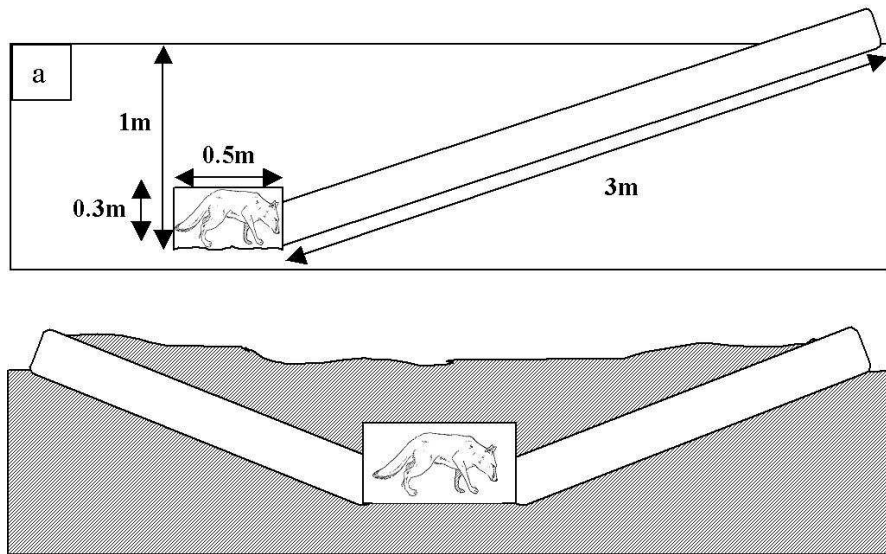
Igloo-style dog house (for "small" dogs - approximately 30" diameter at base, 24" tall)

Both chamber designs have open bottoms. Holes are cut into the sides of the chambers where tunnel pipes enter.



**Figure 1. Artificial escape dens for San Joaquin kit fox at Bakersfield, CA. a) Escape den schematic. b) High-density polyethylene escape den under construction. c) Completed den. d) Kit fox entering escape den.**





**Figure 2. Artificial subterranean dens for San Joaquin kit fox at Bakersfield, CA. a) Artificial den schematic. b) PVC two-entrance chamber den under construction. c) High-density polyethylene two-entrance den. d) PVC tunnel with floor removed longitudinally.**



**Figure 1. Kit fox pups at artificial subterranean dens at a golf course (a) and drainage basin (b) in Bakersfield, CA.**



# WESTERN BURROWING OWL RELOCATION PLAN

---

## MARICOPA SUN SOLAR PROJECT, KERN COUNTY, CALIFORNIA

March 2014

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Quad Knopf

# WESTERN BURROWING OWL RELOCATION PLAN

## Maricopa Sun Solar Project, Kern County, California

**Prepared for:**

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**March 2014**

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## 1.0 INTRODUCTION

Maricopa Sun, LLC (Project Administrator) is in the process of developing a solar complex (Maricopa Sun Solar Complex [Project]) in southern Kern County, California (Figure 1). The Project currently consists of seven Solar Sites that total 3,798.3 acres located within southwestern Kern County, California, approximately three miles northeast of the unincorporated community of Maricopa (Figure 2, Table 1). Activities associated with the Project include site preparation and grading, commercial operation, maintenance, and project decommissioning, all of which may put sensitive biological resources, including western burrowing owl (*Athene cunicularia*), at risk.

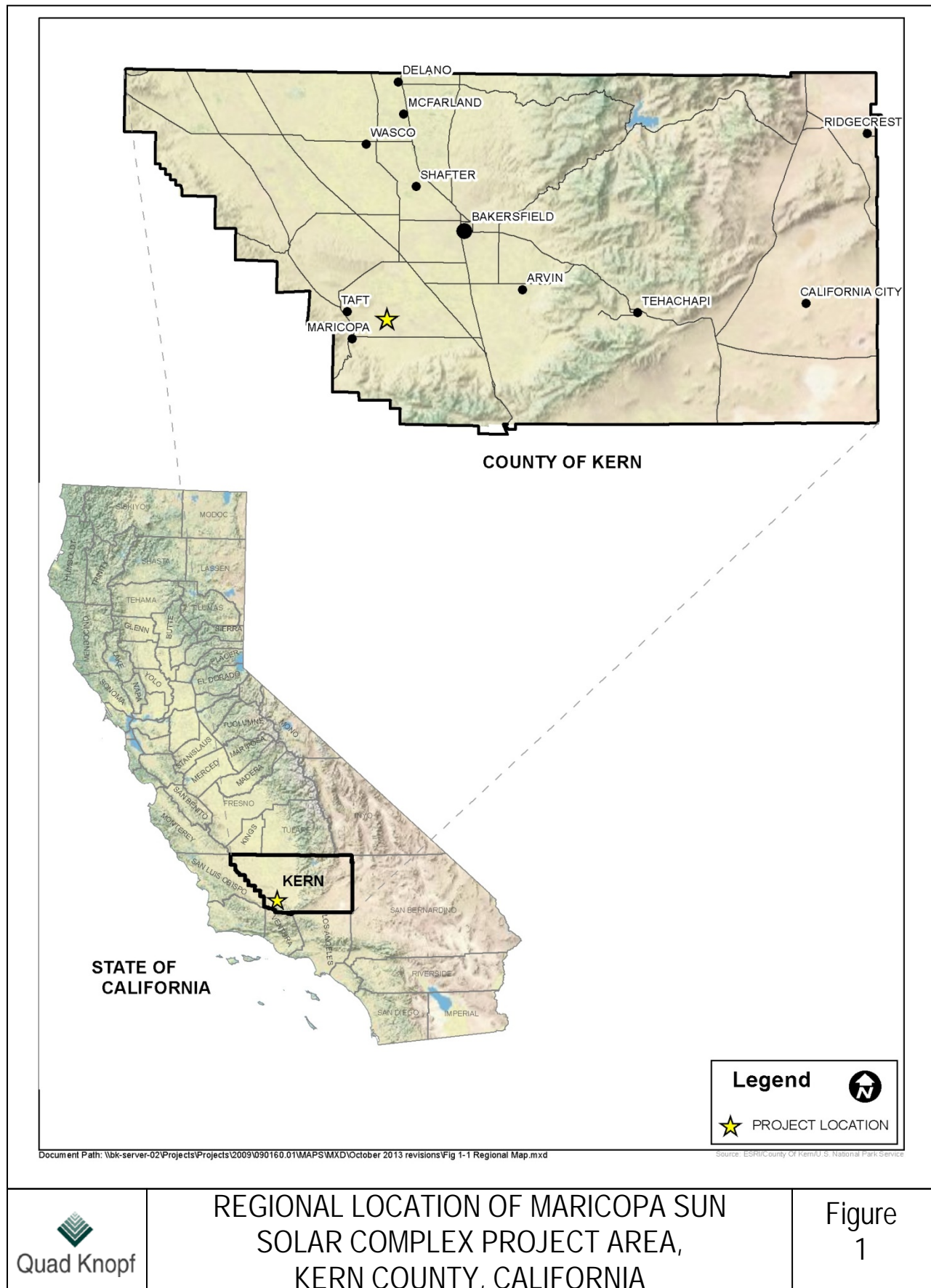
**Table 1**  
**Maricopa Sun Solar Complex: Solar Sites**

Site Number	APN	Township, Range	Solar Sites (acres)
Site 2-S	220-120-(18-19)	T.32S., R.25E., Sec.21	628.8
Site 3-S	220-110-08	T.32S., R.25E., Sec.23	460.4
Site 4-S	295-040-(30-31)	T.32S., R.26E., Sec.19	652.5
Site 5-S	220-170-(01-02,05,07)	T.32S., R.25E., Sec.29 & 30	797.2
Site 6-S	220-130-01	T.32S., R.25E., Sec.27	304.2
Site 7-S	220-130-(02,12)	T.32S., R.25E., Sec.25&26	471.6
Site 15-S	295-130-25	T.32S., R.27E., Sec.33	483.6
<b>TOTAL</b>			<b>3798.3</b>

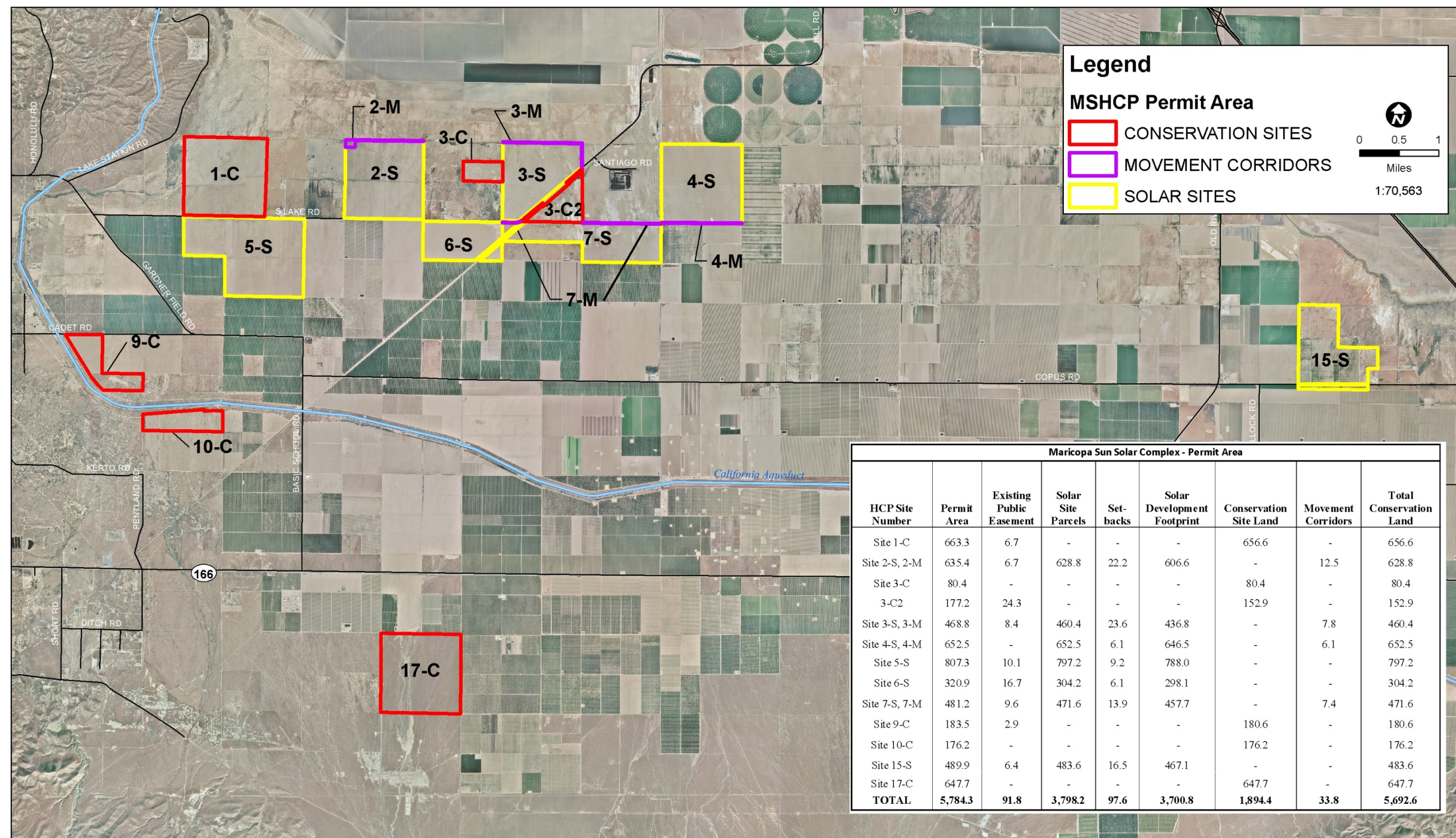
Although the Solar Sites have been repeatedly disked and contain minimal habitat value, the western burrowing owl is known to occur on at least some of them. No burrows of this species were found, but western burrowing owls were observed perching on the ground and likely use at least some of the Solar Sites for limited foraging. The western burrowing owl is common in the Project vicinity and burrows are located on lands adjacent to the Solar Sites. This species is at risk from the Project development.

The purpose of this relocation plan is two-fold: 1) to ensure that standard protection, avoidance and minimization measures will be implemented to avoid and reduce adverse effects of the Project to western burrowing owls; and 2) to establish standard guidelines for the relocation of western burrowing owls, should that become necessary.

The western burrowing owl is protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 and is designated as a Species of Special Concern by the California Department of Fish and Wildlife (CDFW). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR (Code of Federal Regulation) Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Sections 3503, 3503.5, and 3513 of the CDFW Code prohibit the take, possession, or destruction of birds, their nests or their eggs. To avoid violations of these federal and state regulations, provisions of these laws generally require that project-related disturbance at active nesting territories be reduced or eliminated during the nesting season, from February 1 to August 31. Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) may be considered “take,” and is potentially punishable by fines and/or imprisonment. Individual burrowing owls are protected, regardless of season, in order to ensure that a viable breeding population of this owl species persists in the wild.







Maricopa Sun Solar Complex - Permit Area								
HCP Site Number	Permit Area	Existing Public Easement	Solar Site Parcels	Set-backs	Solar Development Footprint	Conservation Site Land	Movement Corridors	Total Conservation Land
Site 1-C	663.3	6.7	-	-	-	656.6	-	656.6
Site 2-S, 2-M	635.4	6.7	628.8	22.2	606.6	-	12.5	628.8
Site 3-C	80.4	-	-	-	-	80.4	-	80.4
3-C2	177.2	24.3	-	-	-	152.9	-	152.9
Site 3-S, 3-M	468.8	8.4	460.4	23.6	436.8	-	7.8	460.4
Site 4-S, 4-M	652.5	-	652.5	6.1	646.5	-	6.1	652.5
Site 5-S	807.3	10.1	797.2	9.2	788.0	-	-	797.2
Site 6-S	320.9	16.7	304.2	6.1	298.1	-	-	304.2
Site 7-S, 7-M	481.2	9.6	471.6	13.9	457.7	-	7.4	471.6
Site 9-C	183.5	2.9	-	-	-	180.6	-	180.6
Site 10-C	176.2	-	-	-	-	176.2	-	176.2
Site 15-S	489.9	6.4	483.6	16.5	467.1	-	-	483.6
Site 17-C	647.7	-	-	-	-	647.7	-	647.7
<b>TOTAL</b>	<b>5,784.3</b>	<b>91.8</b>	<b>3,798.2</b>	<b>97.6</b>	<b>3,700.8</b>	<b>1,894.4</b>	<b>33.8</b>	<b>5,692.6</b>

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SITE PLAN  
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure  
2



To ensure protection of the burrowing owl, the standard protection measures provided in CDFW's October 17, 1995 *Staff Report on Burrowing Owl Mitigation* shall be implemented. Any relocation of western burrowing owls for the Project will meet the standards provided in this document.

## 2.0 METHODS

This section provides standard information on protection, avoidance, and minimization measures for western burrowing owl, site-specific mitigation measures, and information on relocation strategies.

Implementation of the measures provided below is intended to minimize the adverse effects of the Project to burrowing owls and the resources that support viable owl populations. These measures are adopted from standard guidelines published by the CDFW (CDFG 1995), which are intended to provide a decision-making process that should be implemented whenever there is the potential for an action or project to adversely affect burrowing owls or their resources. Project site-specific surveys have been completed and western burrowing owls are known to occur on some of the Solar Sites, and they could be present on any of the Solar Sites prior to initiation of construction activities. Full winter and summer surveys following CDFW guidelines (CDFG 1995) are not warranted because the presence of burrowing owls has been established. However, pre-construction surveys will be implemented prior to construction, repairs and maintenance that requires ground disturbance, and prior to decommissioning activities. The standards for these surveys and other related measures are presented below.

### 2.1 *Pre-construction Avoidance Survey*

Prior to ground disturbing activities, a qualified biologist will conduct pre-construction surveys for western burrowing owls over the entire Project activity area and a 500-foot (approx. 150 meters) buffer. Pedestrian surveys will be conducted and transects will be spaced to provide 100 percent visual coverage of the Project area. Transects will be spaced approximately 100 feet (30 meters) apart unless variation in the terrain requires shorter distances to accomplish 100 percent visual coverage. The surveys will be conducted no more than 14 days prior to ground disturbing activities. If more than 14 days lapse between the time of the pre-construction survey and the start of ground-disturbing activities, another pre-construction survey must be completed. Pre-construction surveys will be completed prior to the initiation of the initial solar site development, ground disturbing repairs and maintenance, and decommissioning.

### 2.2 *Adverse Effects to Burrowing Owls, Avoidance, and Buffer Zones*

When pre-construction surveys confirm the presence of western burrowing owls, the mitigation measures described below will be followed to minimize adverse effects to burrowing owls, their burrows and foraging habitat on the site. Adverse effects are defined as:

- Activities occurring within 160 feet (approx. 50 meters) of occupied burrows are considered disturbance or harassment;
- The destruction of actively used natural or artificial burrows, such as culverts, concrete slabs, and debris piles that provide shelter to burrowing owls is considered an adverse effect, and the removal of these features will trigger replacement of same at standard ratios; and
- The destruction or degradation of foraging habitat adjacent to occupied burrows is considered an adverse effect and compensation for the loss of this habitat will be provided at standard ratios.

Whenever possible, burrowing owls and their habitat will be protected in place by the use of buffer zones, visual screens, or other measures while project activities are occurring in order to minimize disturbance. As a general guideline for establishing buffers, 160-foot (approx. 50 meter) buffers will be implemented during the non-breeding season (September 1 through January 31), and 250-foot (approx. 75 meter) buffers will be implemented during the breeding season (February 1 through August 31), but these may be adjusted by a qualified biologist to address site-specific conditions. Adjustments to these buffer areas must not lead to abandonment of nests, disruption to breeding activities (e.g., nesting, rearing or feeding of young), or temporary or permanent abandonment of a burrow site.

### ***2.3 General Burrowing Owl Protective Measures***

To ensure the protection of western burrowing owls, the following project-related measures will be implemented:

- Before work may begin within areas where burrowing owls are known to occur, the contractor's personnel must receive Employee Education Program (EEP) training, which will be presented by a qualified biologist. A record of each employee completing training will be maintained on site by the contractor. No personnel may begin work on site, including delivery of materials and mobilization, until the personnel have received this training. All contractor personnel, having completed the EEP training, will be responsible for identifying any species in harm's way within the project limits and stopping work in the immediate area, should the need arise;
- On-site personnel will comply with directions from qualified biologists, whose role is to help on-site personnel with compliance guidelines and environmental laws. Biologists may need to complete certain tasks during construction activities, and while they will not attempt to slow construction, some activities may necessitate this in order for biologists to fulfill their responsibilities. Biologists have the authority to temporarily halt construction activities that could harm sensitive biological resources, including nests and burrows. Such direction, when provided by the biologist, will not be the basis for a claim by the contractor;
- The qualified biologist will be available for on-call responses to site situations through the duration of on-site construction activities;

- For each day the biologist is in the field or required for on-call activities, s/he will complete a daily log that documents the date, time, and weather conditions on site, biological monitoring activities, species observations, protective mitigation measures implemented, and any other pertinent biological data. A copy of the daily log will be incorporated into reports as required by the MSHCP;
- Areas flagged, fenced, or otherwise identified as environmentally sensitive are to be avoided. Under no circumstances is travel, equipment, or earth moving permitted in these areas;
- No burrowing owl or active migratory bird nests may be touched. If a burrowing owl or active bird nest is observed, it must be reported immediately to the designated on-call biologist;
- If a burrowing owl or bird nest is harmed or animal killed, accidental or otherwise, the USFWS and the CDFW will be notified immediately. Additionally, the incident must be reported immediately to the lead biologist. Full details of the circumstances of the death or injury will be provided within 24 hours of incident. Contacts for these reporting requirements are:
  - CDFW, Region IV office, 1234 W. Shaw Ave. Fresno, California, 93657, (559) 243-4014; and
  - USFWS, 2800 Cottage Way, Room W-2605, Sacramento, California, 95825, (916) 414-6600.

## 2.4 *Site-Specific Protection Measures*

### BURROWING OWLS PRESENT DURING THE NON-BREEDING SEASON

During the non-breeding season (September 1 through January 31), no disturbance should occur within 160 feet (50 meters) of burrows occupied by the western burrowing owl. This area will be marked as an Environmentally Sensitive Area (ESA) as described below, and will remain in place while construction activities or repairs are being made in the vicinity (within 500 feet of the ESA).

The integrity of the ESA fencing will be maintained by performing an inspection of the fence twice weekly, and implementing any needed repairs within one day of discovery. For the fencing to be considered in suitable condition, it must exhibit the following:

- All t-posts that mark the boundary of the ESA area must be in an upright condition and spaced at approximately 30-foot intervals. All downed posts must be reset;
- The top of the posts must be secured together with rope that is stretched tight between the posts. The rope must not sag to the point of touching the ground, and efforts should be made to keep the height of the rope no lower than three feet from ground level; and

- Survey flagging will be tied to each post and on the rope, mid-way between the posts to ensure that flagging is maintained at intervals of approximately 15 feet around the perimeter of the ESA.

The protected area will be avoided by all construction and ground clearing activities until the burrowing owl has vacated the burrow of its own accord. If an earlier evaluation is necessary, the conditions for removal of the exclusion area and burrow will remain in effect (i.e., prior to removal of the exclusion area and excavation of the burrow, a qualified biologist will inspect the burrow, ensuring that the owl has not been present at the burrow for a minimum of three consecutive days).

### **BURROWING OWLS PRESENT DURING THE BREEDING SEASON**

Occupied burrows should not be disturbed during the nesting season, from February 1 through August 31, unless a qualified biologist verifies that the birds have not begun egg-laying and incubation, or that the juveniles from those burrows are foraging independently and are capable of independent survival.

If western burrowing owls on the construction site or within 500 feet (150 meters) of the construction site appear to be engaged in nesting behavior, occupied burrows should not be disturbed and will be fenced with a 250-foot avoidance area buffer. The avoidance area will be designated as an ESA and be marked with high-visibility flagging every 15 feet. The ESA fencing will be erected between the nest site or active burrow and any earth-moving activity or other disturbance. The Developer may not enter an ESA established around an active bird nest or burrow. The ESA may be removed once it is determined by the Monitoring Biologist that the young have fledged, are foraging independently, and are capable of independent survival.

The integrity of the ESA fencing will be maintained by performing an inspection of the fence twice weekly, and implementing any needed repairs within one day of discovery. For the fencing to be considered in suitable condition, it must exhibit the following:

- All t-posts that mark the boundary of the ESA area must be in an upright condition and spaced at approximately 30-foot intervals. All downed posts must be reset;
- The top of the posts must be secured together with rope that is stretched tight between the posts. The rope must not sag to the point of touching the ground, and efforts should be made to keep the height of the rope no lower than three feet from ground level; and
- Survey flagging will be tied to each post and on the rope, mid-way between the posts to ensure that flagging is maintained at intervals of approximately 15 feet around the perimeter of the ESA.

The protected area will be avoided by all construction and ground clearing activities until the burrowing owl has vacated the burrow of its own accord. Prior to removal of the ESA and

excavation of the burrow, a qualified biologist will inspect the burrow to ensure that the owl has not been present at the burrow for a minimum of three consecutive days.

## **WESTERN BURROWING OWL RELOCATION STANDARDS**

Relocation of burrowing owls will not occur during the breeding season (February 1 through August 31), and will only be accomplished during the non-breeding season (September 1 through January 31). The relocation of burrowing owls may be conducted during the breeding season if a qualified biologist verifies that the birds have not begun egg-laying and incubation, or that the juveniles from those burrows are foraging independently and are capable of independent survival.

If burrowing owls must be moved away from the disturbance area, passive relocation techniques should be used rather than trapping. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond 160 feet from the impact zone, and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls. Passive relocation may not commence until October 1 and must be completed by February 1 (except as otherwise noted above). Two or more weeks may be needed to accomplish passive relocation and allow the owls to acclimate to the alternate burrows. Passive relocation may only be conducted by a qualified biologist or ornithologist. After passive relocation has occurred, the area where owls were originally located and its immediate vicinity (500 feet) will be monitored by a qualified biologist daily for one week and once per week for an additional two weeks to document that owls are not reoccupying the site. Passive relocation of burrowing owls may be accomplished with or without the use of a one-way door system. If these methods fail, active relocation may be used.

**Passive Relocation using One-Way Doors:** Owls may be excluded from burrows that are located within an impact zone or within 160 feet of an impact zone by installing one-way doors on burrow entrances. One-way doors should be left in place 48 hours to ensure owls have left the burrow before the burrow is excavated. The impact area should be monitored daily for one week to confirm owl use of the site has ceased prior to excavating burrows. Burrows will be excavated using hand tools and will be backfilled to prevent owls from reoccupying them. Sections of flexible plastic pipe or burlap bags should be inserted into the tunnels during excavation to maintain an escape route for any animals that may be inside the burrow. Artificial burrows will be created and installed at a ratio of 1:1 in adjacent suitable habitat that is contiguous with the foraging habitat of the affected owls. Each pair of owls (or a single owl) that has been so displaced will be provided with 6.5 acres of foraging habitat at the relocation site.

**Passive Relocation without One-Way Doors:** Although there is a possibility that there will be instances where passive relocation without one-way doors might be appropriate for this project, in most cases, this method is not feasible. Passive relocation without one-way doors requires the installation of artificial burrows or the presence of alternate natural burrows within a 6.5-acre area of the location from which owls would need to be excluded. The expectation would then be that owls would voluntarily move to the newly created burrows and thus vacate the site of Project activities and eliminate the need for other, more invasive, relocation techniques. Given the large scale of the Solar Sites, it is not likely that this amount of protected acreage would



occur near any burrowing owl location. To implement this method, the project area would be monitored daily until the owls have relocated to the new burrows. The formerly occupied burrows would then be excavated. Burrows would be removed using hand tools and backfilled to prevent reoccupation. Sections of flexible plastic pipe would be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow. Artificial burrows would be created and installed in a ratio of 1:1 in adjacent suitable habitat that is contiguous with the foraging habitat of the affected owls.

To ensure proper installation of artificial burrows, the *User's Guide to Installation of Artificial Burrows for Burrowing Owls* (Johnson et al. 2010) will be followed.

### 3.0 CONCLUSION

The techniques described will be implemented as needed during the construction, operations and maintenance, and decommissioning phases of the Project. Implementation of the described protection measures and relocation standards for western burrowing owls will reduce project-related adverse effects to western burrowing owls that currently occupy the Solar Site and/or adjacent habitat. These measures will also reduce adverse effects to burrowing owls that may become established on the Solar Site once solar facilities have been installed. Conducting pre-construction surveys, avoiding burrowing owls whenever possible; and passively or actively removing burrowing owls from construction areas when necessary, then releasing them into artificial burrows within designated Conservation Sites will reduce adverse effects of the Project to this species.

### 4.0 REFERENCES

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# TIPTON KANGAROO RAT AND NELSON'S ANTELOPE SQUIRREL RELOCATION PLAN

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MARICOPA SUN SOLAR PROJECT,  
KERN COUNTY, CALIFORNIA

March 2014

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Quad Knopf

# TIPTON KANGAROO RAT AND NELSON'S ANTELOPE SQUIRREL RELOCATION PLAN

## Maricopa Sun Solar Project, Kern County, California

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**March 2014**

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## 1.0 INTRODUCTION

Maricopa Sun, LLC is in the process of developing a solar complex (Maricopa Sun Solar Complex [Project]) in southern Kern County, California (Figure 1). The project currently consists of seven Solar Sites totaling 3,798.3 acres located within southwestern Kern County, California, approximately three miles northeast of the unincorporated community of Maricopa (Figure 2; Table 1). The Project includes site preparation, grading, commercial operations, maintenance, and project decommissioning, all of which may put sensitive biological resources at risk, including the Tipton kangaroo rat (*Dipodomys nitratoide nitratoide*) and Nelson's antelope squirrel (also known as the San Joaquin antelope squirrel) (*Ammospermophilus nelsoni*).

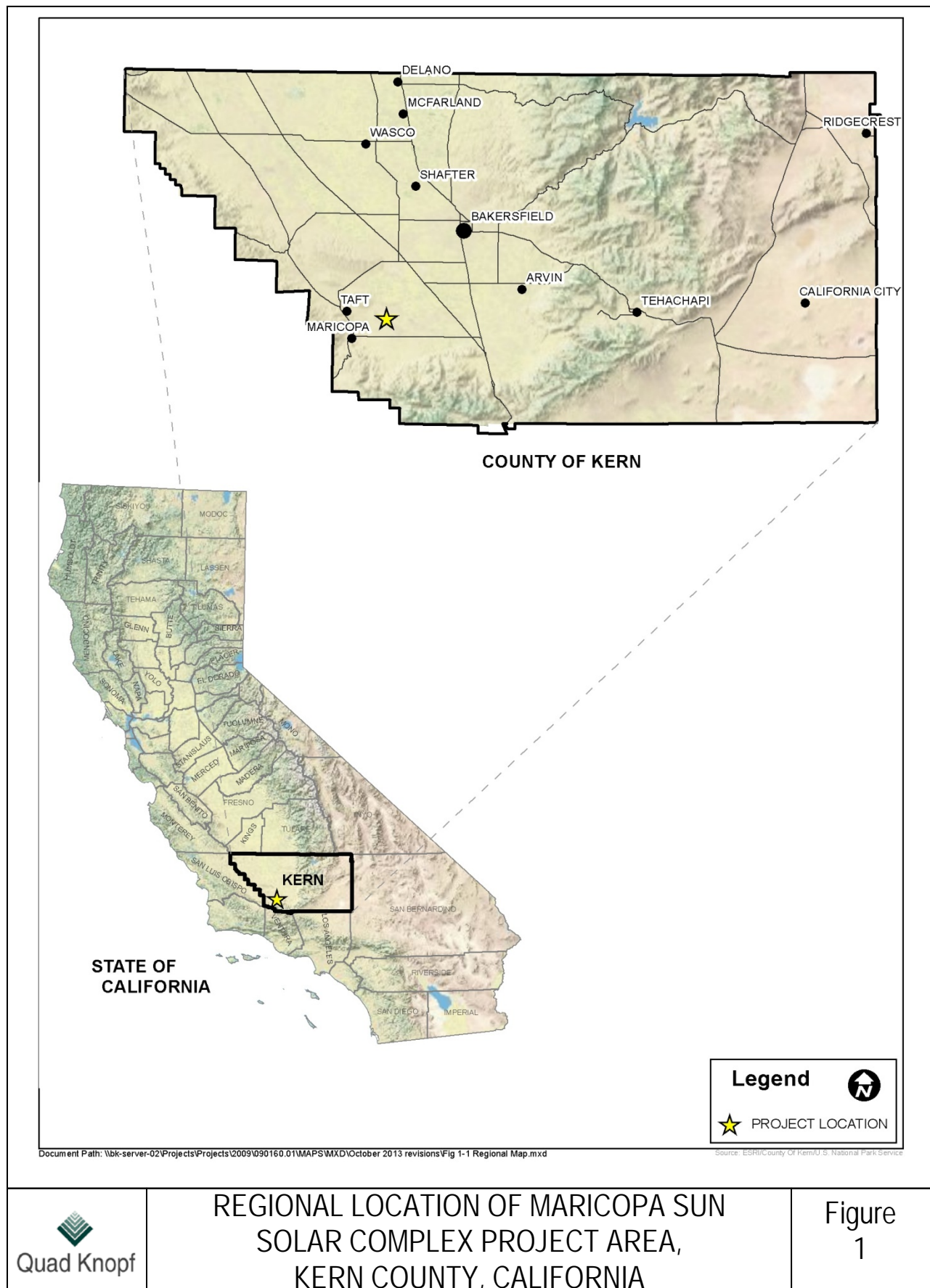
**Table 1**  
**Maricopa Sun Solar Complex: Solar Sites**

Site Number	APN	Township, Range	Solar Site Parcels (acres)
Site 2-S	220-120-(18-19)	T.32S., R.25E., Sec.21	628.8
Site 3-S	220-110-08	T.32S., R.25E., Sec.23	460.4
Site 4-S	295-040-(30-31)	T.32S., R.26E., Sec.19	652.5
Site 5-S	220-170-(01-02,05,07)	T.32S., R.25E., Sec.29 & 30	797.2
Site 6-S	220-130-01	T.32S., R.25E., Sec.27	304.2
Site 7-S	220-130-(02,12)	T.32S., R.25E., Sec.25&26	471.6
Site 15-S	295-130-25	T.32S., R.27E., Sec.33	483.6
<b>TOTAL</b>			<b>3,798.3</b>

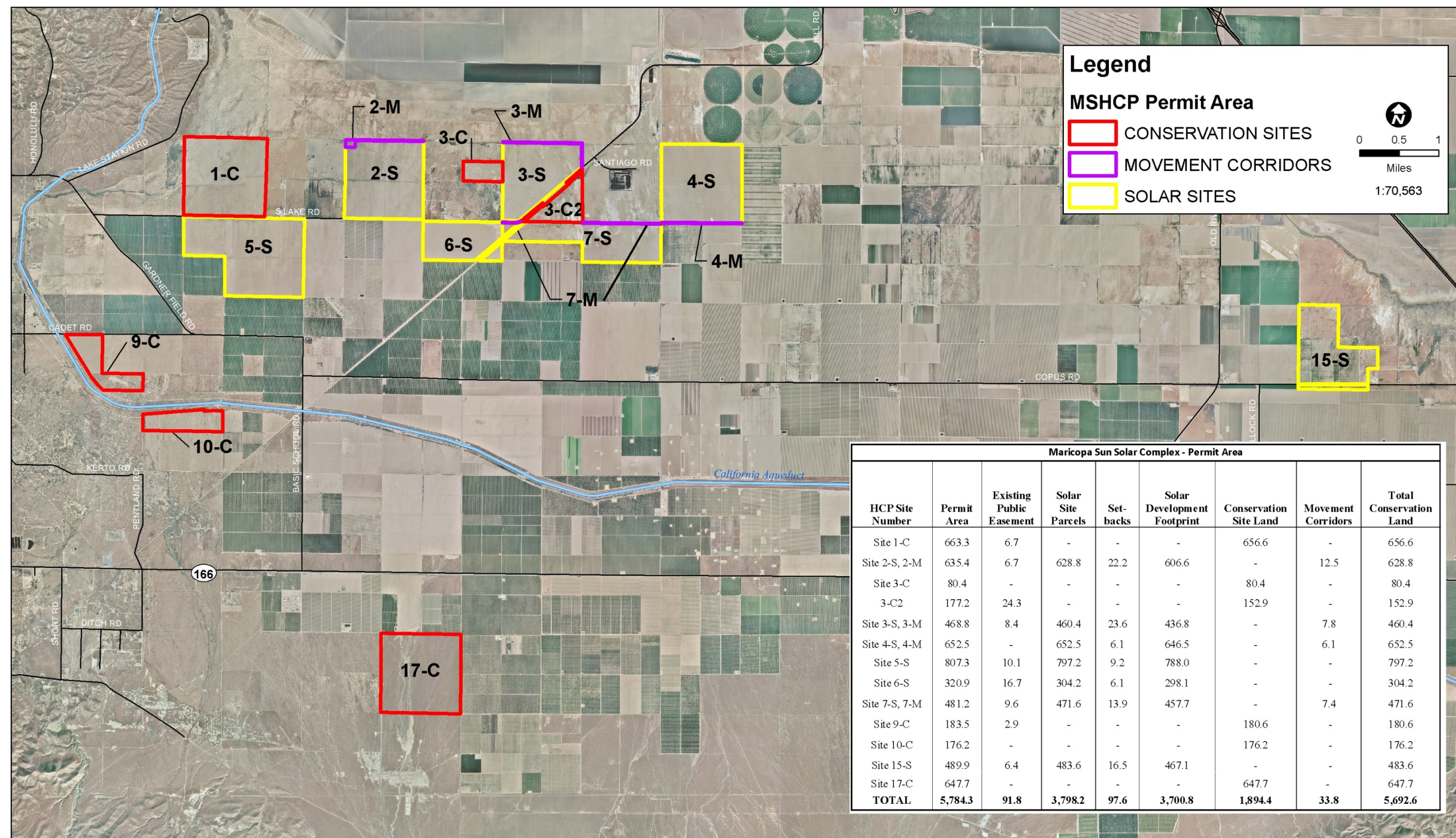
The state and federally endangered Tipton kangaroo rat and the state threatened Nelson's antelope squirrel historically occurred on some of the Solar Sites, but recent and repeated disking has eliminated these species from these areas. Some lands that are adjacent to the Solar Sites do support these species, and the potential exists for these species to become established on the Solar Sites before construction commences and after the solar facilities are in place.

Currently, there is no evidence to support a determination that lethal take of these species will occur during pre-construction and construction activities. Project minimization and avoidance measures will adequately prevent lethal take during operations and maintenance and decommissioning activities. The potential for the Tipton kangaroo rat and Nelson's antelope squirrel to be subject to take during construction will be avoided through the installation of barrier fencing placed between the sites of known occurrences on adjacent lands and on-site construction activities.

The purpose of this relocation plan is two-fold: 1) to ensure that standard avoidance and minimization measures will be implemented to avoid and reduce the impact of the Project on the Tipton kangaroo rat and Nelson's antelope squirrel; and 2) to establish standard guidelines for the trapping and relocation of the Tipton kangaroo rat and Nelson's antelope squirrel, should it become necessary.







Maricopa Sun Solar Complex - Permit Area								
HCP Site Number	Permit Area	Existing Public Easement	Solar Site Parcels	Set-backs	Solar Development Footprint	Conservation Site Land	Movement Corridors	Total Conservation Land
Site 1-C	663.3	6.7	-	-	-	656.6	-	656.6
Site 2-S, 2-M	635.4	6.7	628.8	22.2	606.6	-	12.5	628.8
Site 3-C	80.4	-	-	-	-	80.4	-	80.4
3-C2	177.2	24.3	-	-	-	152.9	-	152.9
Site 3-S, 3-M	468.8	8.4	460.4	23.6	436.8	-	7.8	460.4
Site 4-S, 4-M	652.5	-	652.5	6.1	646.5	-	6.1	652.5
Site 5-S	807.3	10.1	797.2	9.2	788.0	-	-	797.2
Site 6-S	320.9	16.7	304.2	6.1	298.1	-	-	304.2
Site 7-S, 7-M	481.2	9.6	471.6	13.9	457.7	-	7.4	471.6
Site 9-C	183.5	2.9	-	-	-	180.6	-	180.6
Site 10-C	176.2	-	-	-	-	176.2	-	176.2
Site 15-S	489.9	6.4	483.6	16.5	467.1	-	-	483.6
Site 17-C	647.7	-	-	-	-	647.7	-	647.7
<b>TOTAL</b>	<b>5,784.3</b>	<b>91.8</b>	<b>3,798.2</b>	<b>97.6</b>	<b>3,700.8</b>	<b>1,894.4</b>	<b>33.8</b>	<b>5,692.6</b>

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SITE PLAN  
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure  
2



## 2.0 METHODS

This section provides information on a relocation strategy, and methodologies that will be used to trap and relocate Tipton kangaroo rats and Nelson's antelope squirrels, should the need arise. The project activities consist of several phases, including a pre-construction phase, construction phase, operations and maintenance phase, and decommissioning phase. Specific methods that will be implemented during each phase are described below, in sections 2.1, 2.2 and 2.3. General conditions and methodologies applicable to all phases are:

1. All trapping and relocation will be conducted by a qualified biologist that holds a current federal Section 10(a)(1)(B) recovery permit issued by the United States Fish and Wildlife Service and a current California State Scientific Collecting Permit and Memorandum of Understanding (MOU) or other special permit issued by the California Department of Fish and Wildlife (CDFW);
2. Trapping will be conducted prior to planned activities at each location where the presence of sign (i.e., tracks, tail drags, dust baths, runways) indicating active kangaroo rat and/or antelope squirrel presence is determined by pre-activity surveys. Trapping will be performed for a minimum of four nights, and will continue until there are two consecutive nights of unsuccessful trapping. Modified Sherman™ live traps (Model XLKR: 13 inches x 3.5 inches x 3 inches) will be used to reduce the risk of injury (e.g., tail lacerations or excisions) to any small mammal species that may be captured. Each trap will be baited with a mixture of rolled oats, millet, and peanut butter. A wad of paper towel will be placed within traps as necessary to reduce trap-chewing behavior, which can result in injuries to the mouthparts of trapped rodents. Traps will be opened and baited prior to dusk and checked at least once a night. Traps will be checked every three hours throughout the night when cold or wet conditions prevail to ensure that no trapped rodents succumb to the elements. Checking of traps will continue after sunrise. Traps will be closed during the trapping period only after a sufficient period of time has lapsed, depending upon weather conditions, with temperatures between 10 and 32 degrees Fahrenheit. All traps will be closed prior to daytime temperatures reaching 32 degrees Fahrenheit. Captured animals will be identified to species, weighed, and their sex, age, and reproductive condition determined before being translocated or released. Data will be recorded on data sheets to include date, time, names of observers, and weather conditions with air temperature, wind, humidity, cloud cover, and moon phase information, along with specific details related to the captured animal;
3. All burrows where small mammals are captured will be inspected with a burrow scope (e.g., Peep-A-Roo™) the morning following capture. If no animals are present in the burrow, the burrow will be hand excavated by a qualified biologist. All other active small mammal burrows where no captures occur will be inspected with a burrow scope and will be hand excavated by a qualified biologist before the excluded area will be cleared for construction activities;
4. Permanent disturbance to an area will require translocations of animals to other areas. All translocated animals will be moved a minimum of 1,600 feet (approx. 500 meters) from



their points of capture, and will be released into established Conservation Sites. To minimize stress and ensure survival, relocated Tipton kangaroo rats will be “soft-released” as described below (Section 2.1). Nelson’s antelope squirrels will be “hard-released” directly to a relocation site (Section 2.2);

5. If disturbance to an area is temporary, it may be feasible to release animals at the point of capture. If disturbance to an area will persist for fewer than ten days, animals will be held in captivity for the duration of the disturbance and then hard-released at the point of capture as described below (Section 2.2); and
6. A biological monitor will be present during all project-related activities that may result in take of covered species. Monitoring reports will be prepared to comply with CDFW standards.

## ***2.1 Pre-construction and Construction Phase***

Neither of the rodent species (Tipton kangaroo rat and Nelson’s antelope squirrel) has been documented to currently exist on the Solar Sites, which have been repeatedly disturbed by disking. The possibility exists that either species may be present in certain areas or become established prior to the beginning of construction. Pre-construction surveys for both rodent species will be conducted prior to the start of any construction activities on and within 500 feet of all solar sites to determine locations of small mammal burrows with sign of either rodent species (i.e., tracks, tail drags, dust baths, runways). Barrier fencing will be established between the construction areas and existing rodent populations on adjacent lands to reduce impacts from construction on these species. The distance between barrier fencing and small mammal burrows will be a minimum of 30 feet so as to avoid the inadvertent collapse or degradation of any unseen, subsurface burrow systems. Barrier fencing will consist of a solid fence buried six inches below grade and extending a minimum of 30 inches above grade. The fencing material will have a smooth finish to prevent rodents from climbing over the fence. The fence will not fully enclose rodent populations, but will extend perpendicular to the disturbance area to a minimum of 500 feet beyond the range of the population.

If any small mammal burrows found to be active with rodents are identified to occur within the disturbance footprint, small mammal trapping will be conducted and all burrows will be inspected and hand excavated following the methodologies described above. All captured Tipton kangaroo rats will be translocated to one of the Project’s designated Conservation Sites (Figure 2) and soft-released. Captured Nelson’s antelope squirrels will be translocated to one of the Project’s Conservation Sites and directly hard-released as described below.

The soft-release method will involve a small enclosure, approximately 10 feet by 10 feet, in the selected Conservation Site. The enclosure will consist of ¼-inch hardware cloth that will be buried 6 inches below grade, extend 2 feet above grade, and have an enclosed top. Four artificial burrows will be installed within each enclosure. Artificial burrows will be constructed of 2-inch PVC pipe fashioned into a “T” shape and will be placed below grade under 3 to 10 inches of topsoil. The artificial burrow will be approximately 2 feet long on a side. Each translocated Tipton kangaroo rat will be released into an artificial burrow contained within the enclosure.

Only a single animal will be released into each enclosure. Supplemental feeding is believed to be crucial to the success of translocated animals; therefore, each translocated animal will be provided with supplemental food to increase survival and minimize the negative effects of the translocation. Kangaroo rat activity within the enclosure will be monitored and supplemental food provided on a weekly basis until the animal has escaped from the enclosure of its own accord, at which point translocation will be considered complete.

## ***2.2 Operation and Maintenance Phase***

It is anticipated that Tipton kangaroo rats and Nelson's antelope squirrels will become established on the Solar Sites during the operation and maintenance phase. The rapidity and degree of colonization, and the abundance of animals present at any particular site or at any given area within a site will depend upon a variety of factors, including proximity to a source population, the degree that suitable habitat develops, the presence of predators, seasonal and annual weather conditions, and other factors. Because Tipton kangaroo rats and Nelson's antelope squirrel could become present at any time on the sites, pre-construction surveys will be conducted prior to any maintenance activities that consist of ground disturbance. If any small mammal burrows active with rodents are identified within the disturbance area, small mammal trapping will be conducted and all burrows will be inspected and hand excavated as described above. All other small mammal burrows in the vicinity of the disturbance area with the potential to contain rodents will be inspected and hand excavated to prevent accidental collapse during maintenance activities. Small mammal burrows active with rodents existing outside of the disturbance area will be protected by the installation of barrier exclusion fencing, as described above.

Captured Tipton kangaroo rats and Nelson's antelope squirrels will be held in captivity until the maintenance repairs are finished, or for a maximum of ten days. If maintenance activities will exceed ten days, captured rodents will be hard-released (not released into an enclosure) at existing or artificial burrows located on site, but at a distance of at least 500 meters from their point of capture. If existing burrows suitable for kangaroo rats or antelope squirrels are not available, artificial burrows will be installed, as described above. For activities that are less than ten days in length, rodents will be hard-released back to the area from which they were trapped. Existing burrows will be used whenever possible, but if the released rodent does not voluntarily enter an offered existing burrow, then artificial burrows will be installed at a rate of four burrows for each animal released. Artificial burrows will be constructed of 2-inch PVC pipe into a "T" shape, and will be placed under 3 to 10 inches of topsoil. No enclosure will be constructed and no supplemental food need be provided.

## ***2.3 Decommissioning Phase***

Tipton kangaroo rats and Nelson's antelope squirrels could become established on the Solar Sites during the operation and maintenance phase and so, may be present during decommissioning of the solar facilities. The rapidity and degree of colonization, and the abundance of animals present at any particular site or at any given area within a site will depend upon a variety of factors including proximity to a source population, the degree that suitable habitat develops, the presence of predators, seasonal and annual weather conditions, and other factors. The number of

rodents present may dramatically fluctuate in any given year in response to weather conditions and stochastic events. The risk of take of Tipton kangaroo rats and Nelson's antelope squirrels during the decommissioning phase would depend upon their abundance and distribution on any particular site and the care with which removal of the solar facilities are conducted.

Pre-construction surveys will be conducted to determine the distribution and relative abundance of Tipton kangaroo rats and Nelson's antelope squirrels on a site prior to the implementation of decommissioning activities. These surveys will consist of locating, counting, and mapping the presence of small mammal burrows. Trapping will be conducted to verify species presence.

Decommissioning activities within areas that are occupied by Tipton kangaroo rats and/or Nelson's antelope squirrels will be conducted in a manner that will prevent mortalities and minimize other impacts to the species. For smaller areas that are inhabited by rodents, trapping, removal, and keeping rodents in captivity, followed by hard-release back to the point of capture into existing or artificial burrows will result in adequate protection. However, for larger areas that are inhabited by rodents, a more rigorous approach to protection would be necessary. In these larger areas, decommissioning activities will be "progressive", to ensure that rodents can be removed from the work area prior to solar removal activities occurring. Areas no larger than one acre in size will be fenced with barrier fencing installed to a minimum depth of 6 inches below grade. Small mammal trapping will be conducted as described above to remove all rodents within the fenced area. All captured rodents will be kept in captivity in a controlled environment until decommissioning activities within the area have been completed. All burrows that will be impacted by the removal of the solar facilities will be inspected and hand excavated as previously described. After the decommissioning activities are completed within the fenced area, the barrier fencing will be removed and the rodents will be hard-released into remaining burrows or into artificial burrows.

### 3.0 CONCLUSION

Because the Tipton kangaroo rat and Nelson's antelope squirrel currently only utilize the Solar Development Footprint as potential foraging habitat, no lethal take of these species is anticipated during the solar construction phase. Nonetheless, pre-construction surveys will be conducted to verify absence prior to construction. Tipton kangaroo rat and Nelson's antelope squirrel could become established on some or all the project sites during the operations and maintenance phase, and thus be at risk of take during the operations and maintenance and decommissioning phases of the project. Conducting pre-construction surveys, trapping and removing animals from construction areas, and releasing trapped animals at the point of capture or to designated Conservation Site will reduce adverse effects of the project on these species.